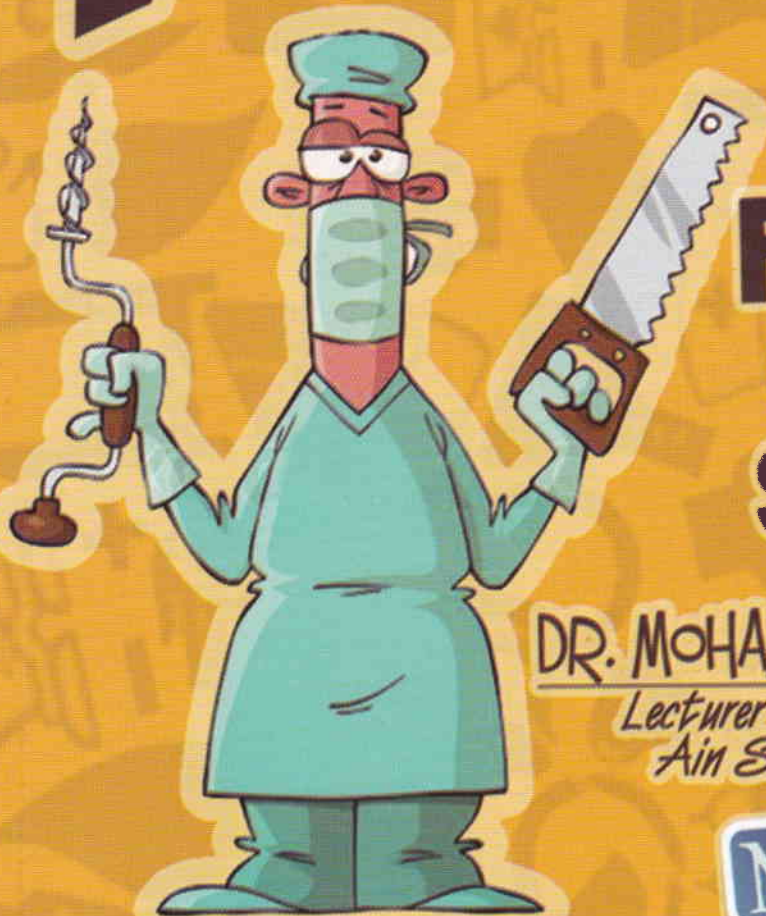


SURGI- TOONS



PART "3"
SPECIAL
SURGERY

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HOW TO USE THIS BOOK ?

This Book is designed to Simplify "Surgery" and make it amusing as it should be. Each branch is mind mapped in the form of tables, algorithms and diagrams to make it easy for you to revise the whole branch in a matter of hours!

There's a bunch of Special Add-ons following each branch in this book, which will make your study driven to the target...



TWEET W GEBNA

Tweets of Information that you may miss during studying the branch, Along with some important points from the MCQs All Together in a couple of papers!!



KEYS TO CASES

Grab the ideas of important Clinical cases, what you exactly need to know about each case in a few words



QUESTION BANK

Questions from previous exams arranged and categorized according to the subject to give you an accurate statistic to drive your attention to the important and repeated questions.



TAKE YOUR NOTES

If you find some extra information useful, Go on! Add them there!!

Have a blast enjoying "SURGI-TOONS" :)

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PLASTIC SURGERY

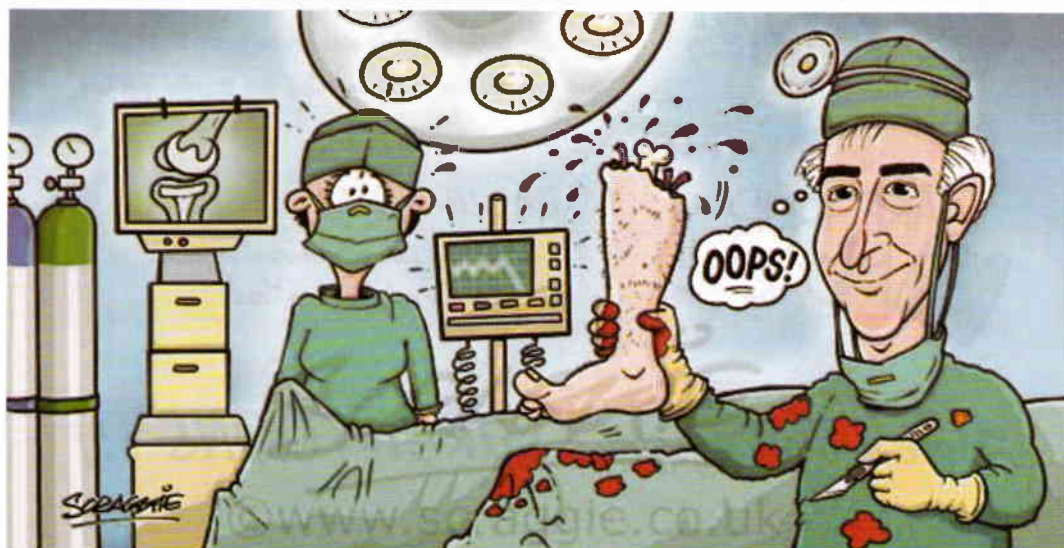
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SURGI-TOONS

ORTHOPEDIC SURGERY



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GENERAL SCHEME FOR FRACTURES

FOR WRITTEN QUESTIONS

SITE

INCIDENCE

TRAUMA

DIRECT, INDIRECT

DISPLACEMENT

**POSITION OF DISTAL FRAGMENT
IN RELATION TO PROXIMAL ONE.**

CLINICAL PICTURE :

SYMPTOMS

- History of trauma
- Pain
- Swelling
- Disturbance Of function (inability to use the affected limb)
- Specific symptoms according to fracture

SIGNS

GENERAL

- Hemorrhage
- Shock
- Associated injury

LOCAL

Inspection

- Echymosis, bruises
- Swelling
- Deformity

Palpation

- Tenderness
- Crepitus
- Temperature (in comparison)

Movement

- Active
- Passive

N, V

- Neurovascular evaluation : Vessels , Nerves

COMPLICATIONS

GENERAL

- Shock
- Fat embolism
- Complications of Prolonged recumbency
- Infection, crush \$

LOCAL

- Skin
- Visceral injury
- Joints
- Blood vessels
- Nerve injury
- Bones
- Ms & Tendons

INVESTIGATIONS

X ray

- A-P view + Lateral view
- Before and after reduction

TREATMENT

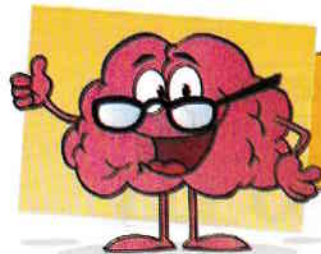
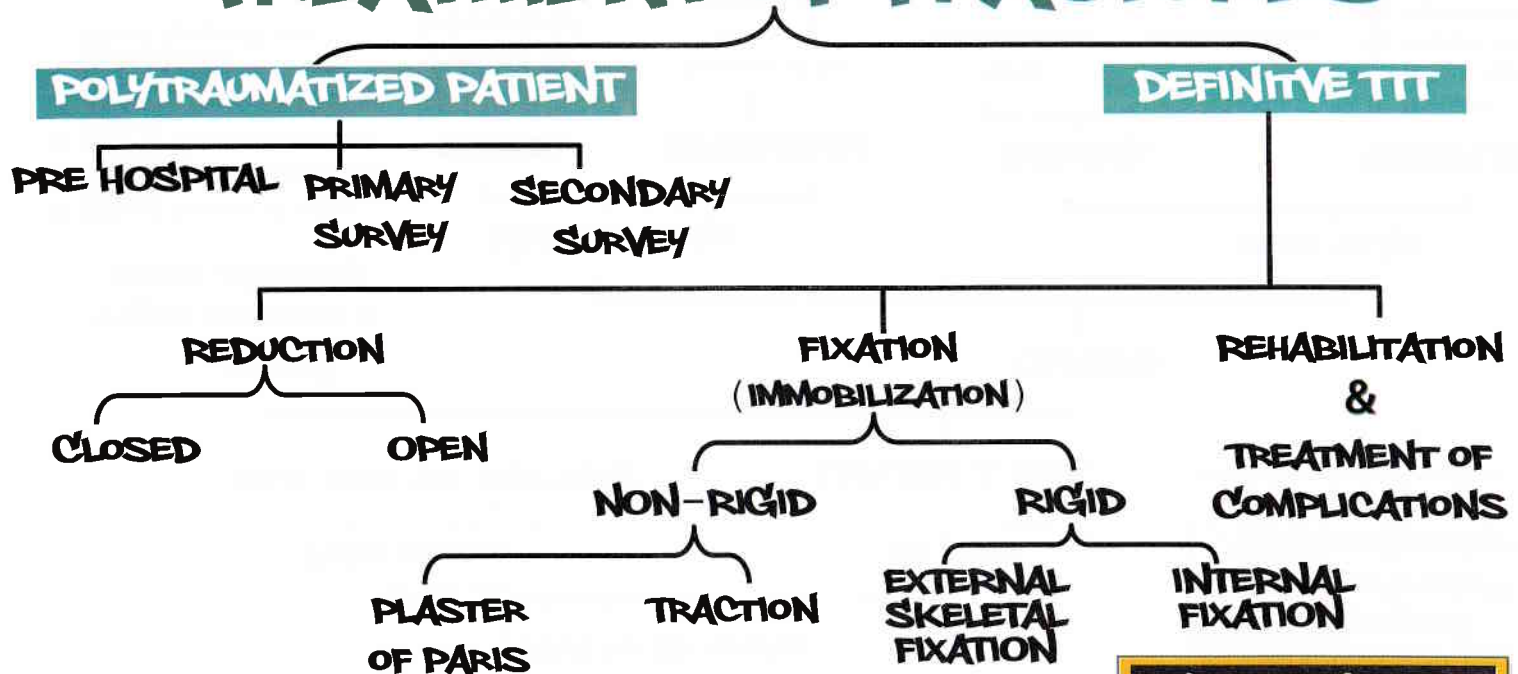
POLYTRAUMATIZED PATIENT

ABCD Resuscitation Definitive

- Reduction
- Fixation
- Rehabilitation
- TTT of complications



TREATMENT OF FRACTURES



Open fractures (Compound) is best treated by Open reduction & External Skeletal fixation



Indications for ORIF

- ⊕ Failed closed reduction
- ⊕ Injury of NVB
- ⊕ Non-Union
- ⊕ Intra-articular fracture
- ⊕ Pathological fracture
- ⊕ Multiple fractures

TTT OF PERIPHERAL ARTERIAL INJURY

- ℞ PRIMARY SURVEY: ABCDE Airway, breathing, circulation, Drugs, exposure
 ℞ SECONDARY SURVEY : Head to toe Exam, AMPLE History , Investigations (Angio ,Doppler)

REDUCTION OF THE FRACTURE

WAIT for 20 minutes

Pulse returns

No pulse

DEAL WITH THE FRACTURE

EXPLORE & DEAL

OPEN

Irrigate with saline &
Wound debridment

- ☒ Skin → Excision of 1-2cm
- ☒ Fascia → Open tense fascia
- ☒ MS. → Excision of dead Ms.
- ☒ Nerve → Mark with black silk
- ☒ Blood vessel → Deal as Closed injury with tear...

WITHOUT TEAR

SPASM

Painting Or
Intra-arterial
papaverine

CONTUSION

Excision of the
contused
segment and
saphenous graft

PARTIAL

<1/2
circumference
Repair with
proline sutures

>1/2
circumference
Treat as
Complete

COMPLETE

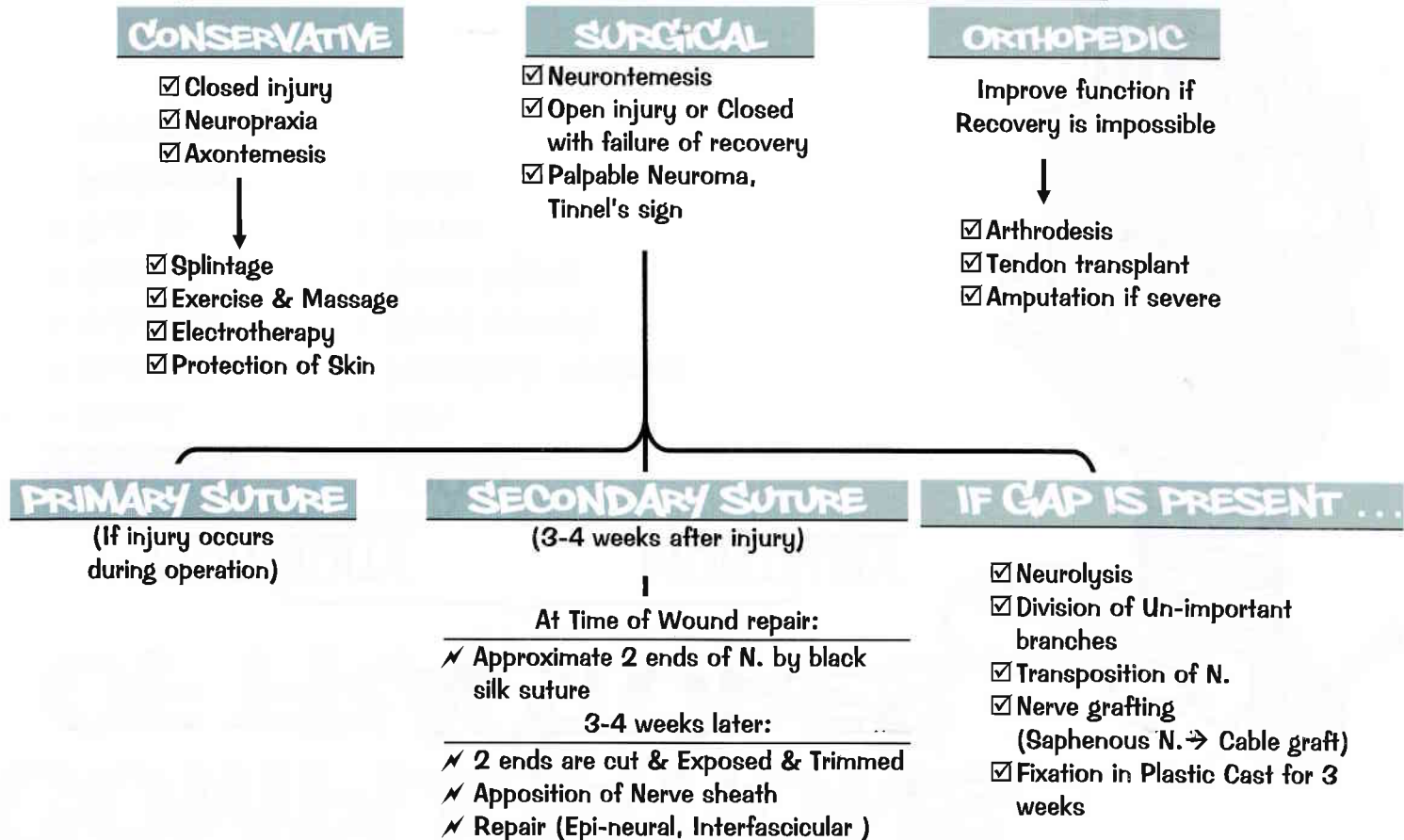
- 1) Repair in oblique manner
- 2) Mobilize artery
- 3) Cut branches
- 4) Saphenous vein graft

♣ CP : 6Ps

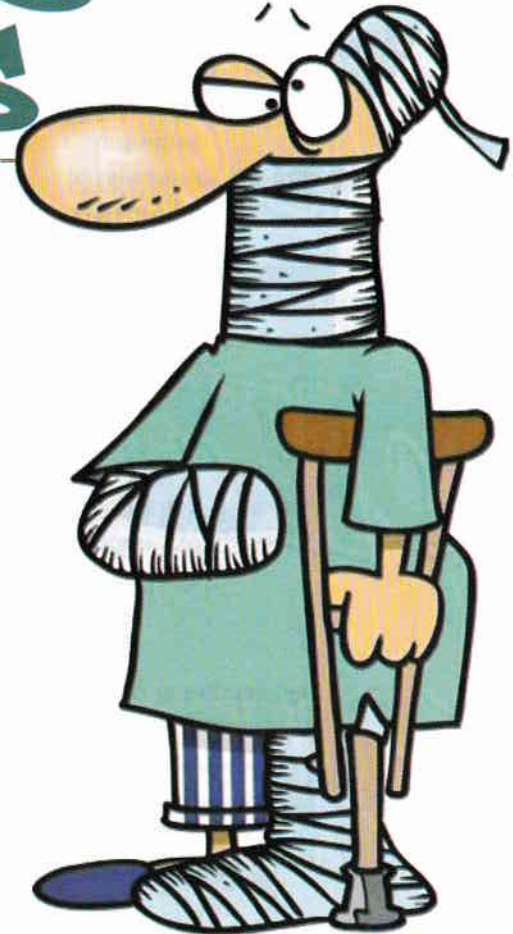
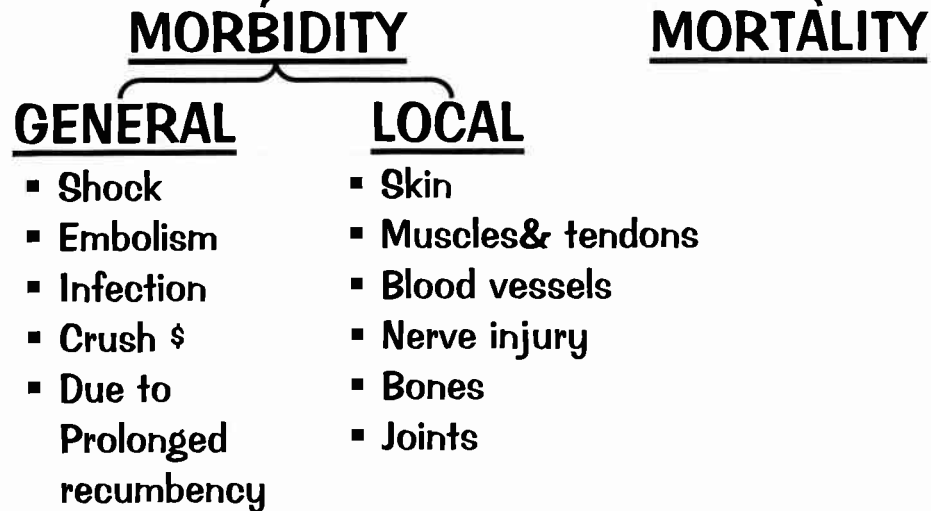
♣ Complications :

- ☒ Wet gangrene
- ☒ Compartmental \$
- ☒ Volkman's ischemic contracture

TREATMENT OF PERIPHERAL NERVE INJURY

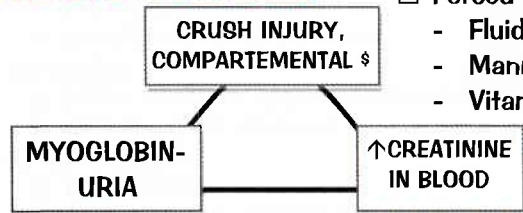


COMPLICATIONS OF FRACTURES



CRUSH SYNDROME

(CRITERIA OF DIAGNOSIS)



TREATMENT:

- ✓ As any Polytrauma ...
- ✓ TTT. of the cause
- ✓ Forced alkaline diuresis
 - Fluid
 - Mannitol
 - Vitamin K

MYOSITIS OSSIFICANS

- ✓ Deposition of Ca^{+2} in soft tissues that Involves → Bone, Periosteum, Lacerated Muscle
- ✓ After ELBOW INJURY
- ✓ Mechanism :
 - Ms. Laceration → hematoma → calcification → Osteoblast invade hematoma → transformed into bone
 - Massage & passive stretching of joints → Traumatic ossificans
- ✓ Clinical picture :

ACTIVE STAGE	QUIESCENT STAGE
Pain, swelling, hotness	Pain ↓
↓ Mobility	STIFFNESS
Cloudy shadow of ossification	circumscribed dense shadow

- ✓ Treatment :
 - 1) Prophylactic → early reduction of fractures & avoid Massage
 - 2) Active → Immobilization & resection after 6 months



SUDECK ATROPHY

- ✓ Marked osteoporosis & thickening of soft tissues due to disuse atrophy or Sympathetic overstimulation
- ✓ Complicates :
 - Colle's fracture, Pott's fracture, Scaphoid bone fracture
- ✓ Clinical picture :
- ✓ Neurotic female → pain, swelling, stiffness, vasomotor changes
- ✓ X-ray → Patchy osteoporosis, Glass app. Of bone
- ✓ Treatment :
 - ℞ Prophylactic → Exercise of joints from first day
 - ℞ Active → Hot wax, analgesics, sympathectomy

AVASCULAR NECROSIS

- ✓ Sites: **FSLT:**
 - FEMORAL HEAD → after hip dislocation, Fracture neck femur
 - CARPAL SCAPHOID
 - CARPAL LUNATE
 - TALUS → dislocation, fracture dislocation
- ✓ X-ray → NORMAL early, appears after 3 months
- ✓ TTT : acc. To site :
 - 1) Femoral head → Austin moore head
 - 2) Scaphoid ischemic Necrosis → Vascularized graft from fibula

ARTERIAL COMPLICATIONS

COMPARTMENTAL

- ✓ Impairment of circulation try to $\uparrow$ Pressure $>30\text{mmHg}$

ETIOLOGY :

- $\downarrow$ size of compartment
- $\uparrow$ Contents

SITES:

MOST COMMON SITE IS THE ANTERIOR COMPARTMENT OF LEG

- a) 4 compartments of Leg : Ant, Lat, Superf, deep posterior
- b) Forearm $\rightarrow$ Volar, dorsal comp.
- c) Hand $\rightarrow$ Intrinsic compartmentthenar, hypothenar, interossi, Lumbricals)

CLINICAL PICTURE :

- ☑ SEVERE pain on PASSIVE extension of digits
- ☑ Absent pulse

COMPLICATIONS :

- ☑ General $\rightarrow$ Crush syndrome
- ☑ Local $\rightarrow$ Gangrene, Volkman's ischemic contracture

TREATMENT:

- ✓ Prophylaxis $\rightarrow$ Avoid tight casts
- ✓ Active $\rightarrow$ Decompression by fasciotomy & debridement



VOLKMAN ISCHEMIC CONTRACTURE

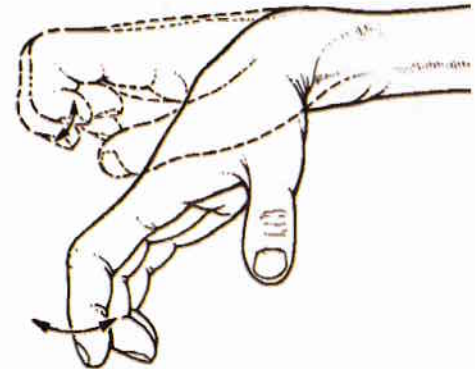
- ✓ Flexion contracture due to fibrosis of Flexor muscles

CLINICAL PICTURE :

- 1) Inability to fully extend Fingers
- 2) Fixed length phenomenon of fingers
- 3) Extension of metacarpo-pharyngeal joints
- 4) Complete Claw hand
- 5) Weak hand grip

TREATMENT :

- ✓ Prophylactic $\rightarrow$ Rapid reduction, avoid tight cast, assessment of vascular condition of Limb
- ✓ Active :
 - a) Early $<8\text{hrs}$ $\rightarrow$ reduction of fracture + Vasodilators
 - b) If compartmental $\rightarrow$ Remove cast + Fasciotomy
 - c) If Late cases with Fibrosis $\rightarrow$ Physiotherapy & Tendon transfer



BONE COMPLICATIONS

Non-Union

Healing doesn't occur after 6 ms

HYPERTROPHIC

Due to Presence of GAP

ATROPHIC

Due to Loss of blood supply

CLINICAL PICTURE:

- Pain, swelling, disturbance of function (persistent tenderness, abnormal range of mobility)

INVESTIGATIONS:

- **BONE X-RAY:** Gap, **SCLEROSIS OF BONE**
- **BONE SCAN:** ↑ Uptake in Hypertrophic type

TREATMENT:

- Hypertrophic → Rigid fixation
- Atrophic → Bone Graft & Fixation

DELAYED-UNION

ETIOLOGY:

- **LOCAL:** Inadequate Blood supply, Infection, Foreign body, Type of bone
- **GENERAL:** Age, Nutrition, systemic illness, Drugs (Corticosteroids)
- **ORTHOPEDIC:** Improper reduction, Improper immobilization

CLINICAL PICTURE:

- Pain
- Swelling
- Disturbance of function

INVESTIGATIONS:

- **BONE X-RAY:** Fracture, **NO SCLEROSIS**

TREATMENT:

- TTT. of the cause
- Bone Fixation

MAL-UNION

ETIOLOGY:

- Improper fixation
- Premature removal of cast

TYPES:

- Angular
- Rotational
- Mal-union with shortening

CLINICAL PICTURE:

- Cosmetic deformity
- Interference with function

COMPLICATIONS:

- Osteoarthritis of Nearby Joint

TREATMENT:

- Correction Osteotomy



UPPER LIMB



FRACTURE CLAVICLE

Site		Junction bet medial 2/3 & lateral 1/3
Incidence		MOST COMMON FRACTURE OF UL IN CHILDREN < 10 YEARS
Trauma		Fall on outstretched hand , Blow to clavicle
Displacement		MEDIAL FRAGMENT: Pulled up by sternomastoid LATERAL FRAGMENT: Placed downwards by weight of the limb
Symptoms		As General Scheme ...
Signs	Inspection	As General Scheme + STEP LADDER DROP LACTATING MOTHER POSITION
	Palpation	Broken displaced clavicle
	Movement	
	Neurovascular bundle	  ⊙ SUBCLAVIAN VESSELS → 6p ⊙ BRACHIAL PLEXUS (C8, T1) → Claw hand + loss of sensation of medial side of forearm + medial 3½ fingers
Complications		As Scheme + ... ♣ Most common: MAL-UNION ♣ Rare → Non-union ,Stiffness, Injury of NVB
Investigations		X-RAY:
Treatment	ABCD + Resuscitation	
	Definitive	℞ Immobilization + Follow up of radial pulse ☒ Child → Figure of 8 Bandage ☒ Adult → Arm to Neck sling
	Complications	℞ ORIF if Non-union, NVB injury , Pleural injury

SHOULDER DISLOCATION

- Most common joint dislocated in body
- Common in Adolescents & young adults

ANTERIOR (97-98%)

POSTERIOR

MORE COMMON	INCIDENCE		
Forcible abduction & EXTERNAL rotation	TRAUMA	Forcible abduction & INTERNAL rotation	
Most common displacement → SUB-CORACOID	DISPLACEMENT	Sub-acromial , Sub-spinous	
As scheme...	SYMPTOMS	As scheme... 	
○ LOSS OF SHOULDER CONTOUR	SIGNS		Inspection
○ Pt. holds injured limb at elbow by other hand, with upright			Palpation
○ Upper limb is apparently shorter			Movement
EMPTY GLENOID CAVITY Head is palpable anteriorly			NVB
COMPETE LIMITATION	COMPLICATIONS		
AXILLARY NERVE MOST COMMON, EARLY (Deltoid,, badge area)			
Axillary ARTERY (6Ps)			
▪Fracture Greater tuberosity ▪Rotator Cuff tear → inability to abduct arm ▪ Recurrence: MOST COMMON, LATE ❑ Due to Bankart lesion ❑ TTT : Bankart's Operation			
X-RAY:	INVESTIGATIONS		
▪ A-P view →confirm dislocation ▪ Lateral View → Anterior dislocation			
ABCD + RESUSCITATION	TREATMENT	ABCD + RESUSCITATION	
☞ Reduction under G.A. → Kocher's Method 1) Outward traction 2) External rotation 3) Internal rotation & adduction		☞ Reduction : 1) Adduction 2) External rotation	
☞ Immobilization (adduction, Int Rotation)			
☞ Rehabilitation			
Axillary artery, Nerve Fracture Greater tuberosity Rotator Cuff tear Recurrence	TTT. OF Complications	☞	

SUPRA-CONDYLAR FRACTURE OF HUMERUS

Site		Distal metaphysis above Condyles									
Incidence		Commonest elbow injury in Children									
Trauma		<table><tr><th>EXTENSION TYPE</th><th>FLEXION TYPE</th></tr><tr><td>MOST COMMON (>90 %)</td><td>< 10 %</td></tr><tr><td>Falling on out stretched hand</td><td>falling on tip of flexed elbow</td></tr><tr><td>Distal fragment is displaced POSTERIORLY (by triceps)</td><td>Distal fragment is displaced ANTERIORLY (by Biceps)</td></tr></table>		EXTENSION TYPE	FLEXION TYPE	MOST COMMON (>90 %)	< 10 %	Falling on out stretched hand	falling on tip of flexed elbow	Distal fragment is displaced POSTERIORLY (by triceps)	Distal fragment is displaced ANTERIORLY (by Biceps)
EXTENSION TYPE	FLEXION TYPE										
MOST COMMON (>90 %)	< 10 %										
Falling on out stretched hand	falling on tip of flexed elbow										
Distal fragment is displaced POSTERIORLY (by triceps)	Distal fragment is displaced ANTERIORLY (by Biceps)										
Displacement											
Symptoms		As Scheme									
Signs	Inspection	As Scheme									
	Palpation ملاحظة 4	○ 3 bony landmarks (medial ,lateral epicondyles, Olecranon)→Δ is NOT disturbed ○ Supra-condylar ridge is interrupted									
	Movement	Limited									
	Neurovascular bundle	○ BRACHIAL ARTERY → 6ps ○ Nerve injury Median N (ape hand) , Ulnar N (Partial claw hand) , Radial N (Wrist & finger drop)									
Complications		♣ Acute ischemia ♣ Nerve injury→MEDIAN IS THE MOST COMMON (Anterior Interosseus) ♣ Mal-union → (cubitus valgus leads to Delayed Ulnar Neuritis) ♣ Myositis ossificans									
Investigations : X-ray		As Scheme									
Treatment	ABCD										
	Resuscitation										
	Definitive	Closed Reduction & fixation ☑ Above elbow splint for 3-4 weeks in Extension position of elbow ☑ Radial pulsation observation throughout the maneuver Open reduction is indicated in : ☑ Adult fracture , failure of closure, Failure of Closed Reduction, NVB Injury If Open Fracture : ☑ External skeletal fixation " Dunlop traction"									
	TTT. Of Complications	As scheme									

ELBOW DISLOCATION

ANTERIOR

- ⊙ Direct trauma to elbow
- ⊙ Ulna migrates **FORWARD** + fracture of **OLECRANON**

POSTERIOR

IN EXTENSION

Fall on
outstretched hand

IN FLEXION

- ⊙ Ulna migrates **BACKWARDS**
- ⊙ Fracture of **CORONOID**

TRIANGLE BETWEEN OLECRANON , MEDIAL & LATERAL EPICONDYLES IS DISTURBED

Treatment:

℞ **ORIF**

Treatment:

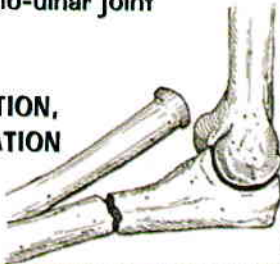
- ℞ Reduction under GA → Downwards & forwards traction
- ℞ Fixation with elbow cast for 3 weeks
- ℞ Exercise for 3 weeks

MONTTEGGIA FRACTURE DISLOCATION

- Fracture of **UPPER 1/3 of ulna**
- Superior Radio-ulnar joint dislocation

TTT:

**OPEN REDUCTION,
INTERNAL FIXATION**



GALEAZZI FRACTURE DISLOCATION

- Fracture of **LOWER 1/3 of RADIUS**
- Inferior Radio-ulnar joint dislocation

TTT:

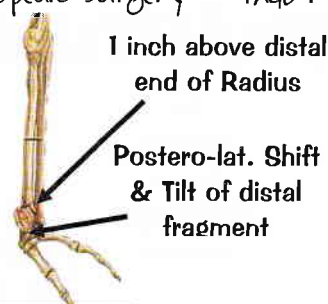
**OPEN REDUCTION,
INTERNAL FIXATION**



FRACTURE HEAD OF RADIUS

- Common in adolescents & Elderly
- Painful Pronation & supination of forearm
- **POSTERIOR INTEROSSEUS NERVE INJURY → FINGER DROP ONLY**
- TTT → ORIF or excision

COLLE'S FRACTURE



Site		Extra-articular fracture, 1 inch above distal end of Radius
Incidence		MOST COMMON IN FEMALE > 50 YEARS .
Trauma		Fall on the palm of outstretched hand
Displacement		Postero-lateral shift & Tilt of Lower segment ناحية ظهر اليد
Symptoms		As scheme
Signs	Inspection	DINNER FORK DEFORMITY .
	Palpation	Radial styloid is NO LONGER lower than Ulna .
	Movement	Loss of active movement, Painful passive movement
	Neurovascular bundle	⊙ RADIAL ARTERY is affected (Tested by ALLEN TEST) ⊙ Median Nerve injury → Ape hand + sensory loss + tests (counting finger, pencil test)
Complications		* MAL-UNION, Carpal tunnel \$, Sudek's atrophy * MADÉLUNG deformity = Ulnar growth > radial growth (In epiphyseal dislocation of Children) * RUPTURE OF EXTENSOR POLICIS LONGUS TENDON
Investigations		X-RAY: ✓ A-P VIEW: Lateral shift ✓ LATERAL VIEW: Posterior shift of distal fragment :: To Differentiate from Smith fracture ::
Treatment	ABCD, Resuscitation	
	Definitive	☑ Closed Reduction & Fixation by Cast for 4-6 weeks 1) Traction of hand 2) Counter traction of humerus 3) Push distal fragment → Anteriorly & Medially 4) Cast is below elbow except if associated with Fracture ulna (above elbow) ☑ Rehabilitation
	TTT. of Complications	⌘ N. injury , Artery injury ⌘ Sudek's atrophy → Sympathectomy, splinting, analgesics, Physio ⌘ Rupture of tendon → Transfer of tendon

SMITH FRACTURE

- ☑ **TRAUMA:** Fall on **DORSUM OF HAND**
- ☑ **DISPLACEMENT:** Distal fragment is Shifted **ANTERIORLY**
- ☑ **CLINICAL PICTURE:** **GARDEN SPADE DEFORMITY**
- ☑ **DIAGNOSIS:** X-ray lateral view to differentiate from Colle's fracture
- ☑ **TREATMENT:** Reduction & fixation by above elbow cast for 6 weeks

FRACTURE SCAPHOID BONE

Site		Waist of scaphoid
Incidence		Most common hand fracture ..
Trauma		Falling on outstretched hand
Displacement		
Symptoms		As scheme+ ... Pain in wrist , Patient can move his hand (no gross impairment)
Signs	Inspection	As scheme+ ...
	Palpation	
	Movement	
	NVB	
Complications		AVASCULAR NECROSIS of proximal fragment
Investigations :		X-ray: Done after 2 weeks
Treatment	ABCD	
	Resuscitation	
	Definitive	☒ Plaster of Paris for 6 weeks → Below elbow +abducted thumb ☒ Internal fixation with Herbert's screw
	Complications	⌘ Bone graft for necrosis

FRACTURE SHAFT ULNA & RADIUS

- ☒ Most common Complication is **COMPARTMENTAL**
- ☒ TTT: Fasciotomy

FRACTURE OF STYLOID PROCESS OF RADIUS

- ☒ Called: **CHAUFFEUR'S FRACTURE**
- ☒ TTT: Colle's Cast for 6 weeks



BARTON'S FRACTURE

- ☒ Intra-articular fracture of Radius

BENNET'S FRACTURE

- ☒ Fracture dislocation of 1st metacarpal



LOWER LIMB



FRACTURE PELVIS

TYPE A FRACTURE (NOT AFFECTING STABILITY OF PELVIC RING)

SINGLE BREAK OF THE PELVIC RING

- AVULSION FRACTURE**
- ✓ **ETIOLOGY:** Sudden violent muscular contraction
 - SARTORIUS → Fracture A.S.I.S.
 - RECTUS FEMORIS → Fracture A.Inferior.I.S
 - ✓ **DIAGNOSIS:**
 - Hx of Trauma, Acute pain
 - Pt. CAN LIFT THE LEG, STAND ON IT
 - ✓ **X-RAY:** Fracture line
 - ✓ **TREATMENT:**
 - Rest, analgesics for 6 weeks

TYPE B FRACTURE (AFFECTING STABILITY OF PELVIC RING)

BUTTERFLY FRACTURE

Double break in anterior segment with posterior displacement of central segment



OPEN BOOK FRACTURE

Wide separation of Symphysis pubis with little separation of ONE sacro-iliac joint



VERTICAL FORCE FRACTURE

- Dislocation of Symphysis pubis & Sacro-iliac joint
- Malgaigne Fracture
- Total pelvic disruption



CLINICAL PICTURE OF FRACTURES AFFECTING STABILITY As scheme +

URO-GENITAL

- ✓ If Clear urine passed → No Injury
- ✓ If NO Clear Urine, Suspected urethral injury → Gentle Retrograde urethrography

RECTAL

- DRE:**
- ✓ Large Hematoma
 - ✓ palpable fracture line

VAGINAL

Do PV for associated Vaginal injuries

COMPLICATIONS

- ✓ Hemorrhagic shock
- ✓ Visceral injury:
 - Intra-pelvic Urethra
 - Extra-peritoneal bladder rupture
 - Injury of rectum, vagina
 - Retro-peritoneal hematoma → Paralytic ileus
- ✓ Sciatic N. injury
- ✓ DVT, Osteo-arthritis
- ✓ Pelvic Mal-union
- ✓ Secondary Osteo-arthritis

INVESTIGATIONS

- ✓ X-ray:
 - Fracture line
 - **POSITIVE OBTURATOR SIGN**
- ✓ CT Scan: rapid evaluation of head, chest, abdomen, pelvis and for associated injuries & Sacral fractures
- ✓ U/S

TTT

POLY-TRAUMATIZED PATIENT

- ✓ First Aid
- ✓ Primary survey
- ✓ Secondary survey

TTT OF FRACTURES

- ✓ If Not affecting stability:
 - Rest, analgesics for 6 weeks
- ✓ If Affecting stability:
 - External fixating system, ORIF

TTT OF COMPLICATIONS

- ✓ U/B → Closure of be water tight Suture then Foley Catheter
- ✓ Urethra → Suprapubic cystostomy, Dilatation
- ✓ Rectum → Colostomy

HIP DISLOCATION

DEVELOPMENTAL HIP DYSPLASIA (=CHD)

TRAUMATIC

- ✓ F > M , 1st Child

البنت البكرية التي نازلة breech وفى ظروف ناشفة oligohydramnios

- ✓ Pathology : Hypoplasia of Hip joint

NEONATES

- ✓ Limitation of abduction in flexion
- ✓ Difficulty in applying Napkins

SPECIAL TESTS

ORTOLANI TEST

On trial to reduce hip, a CLUNK is heard

يحط إيد على فخذ الولد و يحط ال thumb على الفخذ بهينه
منه جوا و الصوابح على ال Hip
و تعمل Abduction
لو عندك DDH تسمع صوت زى زباب التليفزيون القديم

BARLOW TEST

The hip subluxes out of the acetabulum → A CLUNK is heard

عكس الحركة اللي فاتت ...
تفعل الفخذ بشويش و لويا
و هتسمع صوت هتأيدح التليفزيون القديم

INFANTS

- ✓ Delayed walking.
- ✓ Asymmetrical gluteal creases

Gait:

- ✓ If Unilateral → Trendelenberg's Gait بيعلن
- ✓ If bilateral → Waddling gait. بيتترقص.

INVESTIGATIONS

U/S

X-RAY

FIRST 2-3 MONTHS

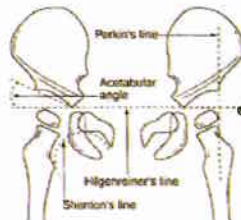
- ✓ At 12 weeks (6ms.)
- ✓ PERKLIN'S LINES

أسم خط بييه الإلتنييه ossification centers of

acetabulum ... أسم خط هه ال

Most prominent part of acetabulum

و أنزل تحت الرأس به تقاطع الخطية المبرسوية



ADOLESCENTS & ADULTS

- ✓ Limitation of abduction in flexion
- ✓ Asymmetrical gluteal creases

TREATMENT

- ✓ **NEW BORN:** Most are spontaneously corrected , so wait till 3 weeks before intervention, If failed → Reduction by VON-ROSEN SPLINT
- ✓ **6 Months-6 Years:** Reduction in Plaster cast with Maintained abduction for 6 weeks
- ✓ **> 6 years:** Corrective osteotomy

TRAUMATIC HIP DISLOCATION

ANTERIOR

POSTERIOR

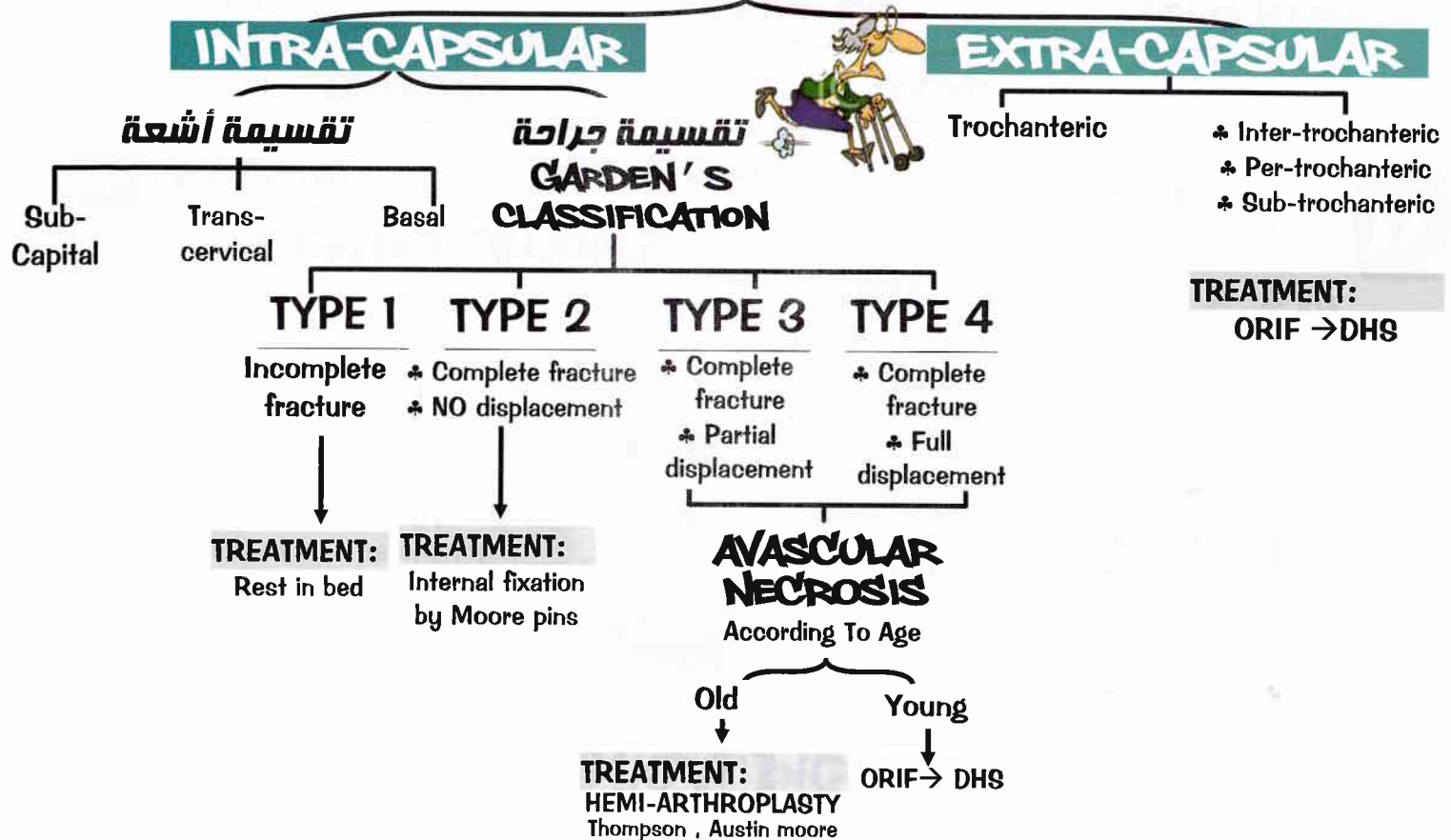
CENTRAL

Obturator
N. injury

MOST COMMON DISLOCATION: 80%

Forcible abduction & External Rotation of flexed hip At Obturator foramen As Scheme...	Trauma	Forcible flexion + adduction + Internal rotation Dash board accident, Fall of heavy object on back of stopping individual
LL is FLEXED, ABDUCTED, EXTERNALLY ROTATED Limb is apparently LENGTHENED Head may be felt	Displacement	Sciatic or ischial
Loss of active & Passive Injury of FEMORAL A. Injury of Femoral & obturator NVB	Symptoms	Pain, swelling, inability to walk or stand
As Scheme...	Inspection	LL is FLEXED, ADDUCTED, INTERNALLY ROTATED.. Limb is apparently SHORTENED
	Palpation	FEMORAL HEAD IS FELT, NARATH SIGN (DIFFICULTY TO PALPATE FEMORAL PULSE DUE TO BACKWARD DISPLACEMENT OF FEMORAL HEAD)
	Movement	Loss of active & Passive
	Neurovascular bundle	Sciatic N. ✦ Motor → Foot drop ✦ Sensory → Back of thigh + Leg, foot except medial aspect
	Complications	General → Shock , Prolonged recumbency Local → Sciatic N. injury , Avascular necrosis, irreducibility , stiffness
▪ X-ray → A-P + lateral ▪ CT scan	Investigations :	▪ X-ray → طالعة لغوق و لبرة (Displacement, empty acetabulum, associated fractures) + Interrupted Shenton's line . ▪ CT Scan → Evaluate intra-articular structures & Femoral head
		ABCD & Resuscitation
Ⓙ Reduction (as Post) Ⓙ Skin traction for 3 weeks by Thomas splint .	Definitive	Ⓙ Closed Reduction by Alli's method (If failed or associated fractures → ORIF) Ⓙ Immobilization for 6 weeks
	After care	Neurological assessment , early motion, Follow up for 2 years
	Complications	Ⓙ Sciatic N. injury

FRACTURE NECK FEMUR



CLINICAL PICTURE

IMPACTED

MISSED FRACTURE

- ✓ No Rotation
- ✓ Limb appears to be abducted
- قاعدة صفا لكن متقدرش تجيب إنتباه



UN-IMPACTED

Symptoms	
Signs	Inspection (MORE IN EXTRA-CAPSULAR TYPE)
	♣ Ecchymosis over Greater trochanter
	♣ Deformity : EXTERNAL ROTATION + ADDUCTION + SUPRATROCHANTERIC SHORTERNING
	Palpation
Tenderness, displacement	
Movement	
ABSENT STRAIGHT LEG RAISING TEST	
Neurovascular bundle	
⊙ SCIATIC N. Injury "Scheme"	

COMPLICATIONS

20% MORTALITY

IN THE 1ST 3 MONTHS

MORBIDITY

GENERAL

PROLONGED RECUMBENCY

- ✓ DVT, P.E
- ✓ Osteoprosis
- ✓ Constipation... Intestinal obstruction

"Colonic Pseudo-obstruction "

TTT: Conservative ... Ryle, Line, Catheter,
Fluids, monitoring, Decompression of Colon

INVESTIGATION : X-RAY

A-P with internal rotation by 15°
صورة باسبورت



LOCAL

INTRA-CAP

- ✓ Mal-union
COXA VARA < 120°
COXA VULGA > 135°
- ✓ NVB

CUT OF BLOOD

- ✓ Avascular necrosis
- ✓ No -union

FRACTURE SHAFT FEMUR

		SUB-TROCHANTERIC	MID-SHAFT	SUPRACONDYLAR
Displacement	Site	5cm below intertrochanteric line	In between	9cm above femoral condyles
	Prox. Segment	Abduction & Fixation (Glutei)	Forward (quadriceps)	Forward (Quadriceps)
	Distal Segment	Adduction & Upwards (Ileo-psoas)	Backwards (Hamstring)	Backwards (G.N.)
Symptoms		As Scheme...		
Signs	GENERAL	SHOCK ..(1-2 LITRES)		
	LOCAL	♣ INSPECTION: Ecchymosis, Bruises, swelling ♣ PALPATION: Tenderness , crepitus ♣ MOVEMENT: Diminished ♣ NEUROVASCULAR BUNDLE: Femoral artery in Midshaft, Popliteal artery and nerve in Supra-condylar .		
Complications As Scheme + ...		○ SHOCK ○ FAT EMBOLISM ○ Prolonged recumbency ○ NVB ○ Myositis ossificans ○ Stiffness of KNEE		
Investigations :		X-ray		
Treatment	ABCD & Resuscitation			
	Definitive	ORIF & Interlocking nail	على حسب السن ✎ Newborn→ Crede's method إعلان ربرى ✎ Infant→ Gallow's traction ✎ Child→ Reduction & fixation by Thomas splint ✎ Adult→ ORIF& Interlocking Nail	ORIF → Interlocking nail
	Complications	Mal-union , Non-union, Infections		

POTT'S FRACTURE

DEFINITION: Fracture lower end of tibia & fibula involving the ankle joint

OBLIQUE		
	EXTERNAL ROTATION	INTERNAL ROTATION
Incidence	MOST COMMON	Rare
1 st DEGREE	Oblique Fracture of LATERAL Malleolus	Oblique Fracture of MEDIAL Malleolus
2 nd DEGREE	1 st + ... TRANSVERSE AVULSION OF MEDIAL MALLEOLUS + LATERAL DISPLACEMENT OF TALUS	1 st + ... TRANSVERSE AVULSION OF LATERAL MALLEOLUS + MEDIAL DISPLACEMENT OF TALUS
3 rd DEGREE	2 nd + POSTEROLATERAL DISPLACEMENT OF TALUS	2 nd + POSTEROMEDIAL DISPLACEMENT OF TALUS

TRANSVERSE		
	ABDUCTION (EVERSION)	ADDUCTION (INVERSION)
Trauma	Fall on EVERTED foot	Fall on INVERTED Foot
1 st DEGREE	Transverse avulsion Fracture of MEDIAL Malleolus	Transverse avulsion Fracture of LATERAL Malleolus
2 nd DEGREE	1 st + ... OBLIQUE AVULSION OF LATERAL MALLEOLUS + LATERAL DISPLACEMENT OF TALUS	1 st + ... OBLIQUE AVULSION OF MEDIAL MALLEOLUS + MEDIAL DISPLACEMENT OF TALUS
3 rd DEGREE	2 nd + POSTERO-LATERAL DISPLACEMENT OF TALUS	2 nd + POSTERO-MEDIAL DISPLACEMENT OF TALUS

VERTICAL COMPRESSION FRACTURE			
	POSTERIOR MARGINAL FR.	ANTERIOR MARGINAL FR.	BURST FR. OF ANKLE
Trauma	Fall on PLANTAR FLEXED Foot	Fall on DORSI-FLEXED Foot	Fall on PLANTIGRADE Foot
	Fracture POSTERIOR Margin of tibia + POSTERIOR Dislocation of Ankle	Fracture ANTERIOR Margin of Tibial + ANTERIOR Dislocation of ankle	Diastasis of Inferior Tibio-Fibular joint + Central dislocation of Talus & Communion of Tibial surface

TREATMENT

- If Poly-traumatized → ABCD, R&M
- **FIRST AID** → Trial of reduction for displaced fractures
- **Definitive TTT:**
 - If Stable → Below knee plaster cast for 6 weeks
 - If Unstable → ORIF by Screw مسمار لکل کسر



NELATON'S LINE :

- Joins ASIS and ischial tuberosity.
- It passes by the tip of greater trochanter. (لأقصى الخط)
- IF GREATER TROCHANTERS LIE ABOVE THIS LINE
→ SUPRA-TROCHANTERIC SHORTENING



BRYANT'S TRIANGLE:

- In supine position, a perpendicular line is dropped from each ASIS.
- Another perpendicular line is drawn from the greater trochanter to the 1st line.
- It is used to assess trochanteric displacement.
- IF SIDE OF TRIANGLE IS SHORTENED → DISPLACEMENT OCCURS



MISCELLANEOUS TOPICS

LIGAMENT INJURY OF THE KNEE

MENISCUS INJURY ركبته بتقفش

- Trauma : twisting strain on flexed knee
- Pt. can walk home, O/E : effusion, incomplete extension, tenderness
- **+VE MCMURRAY'S SIGN** : Click when knee is rotated in flexion
- **INVESTIGATION OF CHOICE** : MRI, Arthroplasty " diagnostic, therapeutic"
- Treatment : Conservative , unless surgery is indicated → Meniscectomy

INJURY TO THE CRUCIATE LIGAMENT

ركبته بتخونه

- Treatment : Conservative
- If surgery is indicated → Meniscectomy

FRACTURE FIBULA:

- Injury to Lateral peroneal N. "Common Peroneal N."
- **CINICAL PICTURE**: Paralysis of peronii → **TALIPUS EQUINO VARUS = FOOT DROP**

FRACTURE TIBIA, FIBULA:

- Most commonly OPEN
- Most common complications is Compartmental \$ (→ TTT: Fasciotomy)



BONE DEFORMITIES

PES PLANUS "FLAT FOOT"

- Congenital (Vertical Talus), infantile, Acquired

PES CAVUS

- **MOST COMMONLY : IDIOPATHIC**
- TTT : soft tissue- wedge Tarsectomy

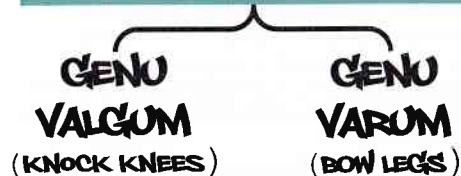
HAMMER TOE:

- Flexion of Interphalangeal Joint

HALLOX VALGUS:

- TTT: excision of Base of Proximal phalynx

KNEE DEFORMITY



CONGENITAL TALIPUS EQUINO VARUS "CLUB FOOT"

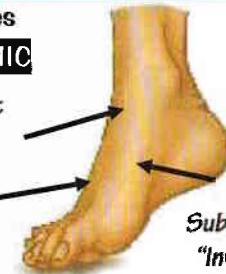
- Bilateral > unilateral , Females > Males
- **MOST COMMON CAUSE IS IDIOPATHIC**



Equines: Ankle joint "Plantar flexion"

Tali: Tarso-metatarsal joint
"Adduction of Forefoot"

Pes: وش القدم



Varus: Subtalat joint
"Inversion of Foot"

- X-ray :

- AP view → **TALO**-Calcaneal Angle Decreased
- Lateral view → **TIBIO**-Calcaneal angle is **OBTUSE**

- Treatment :

- ℞ **MANUAL REDUCTION** from distal to proximal
- ℞ **MAINTENANCE** by : adhesive strapping + Plaster of Paris
- ℞ **AVOID RECURRENCE** → **DENIS BROWNE SPLINT** At Night until the age of 2 years

- Surgical treatment if resistant after 2 years, or relapsing :

- Posteromedial release incision in soft tissue (<2years)
- Bone reshaping (2-10 years)
- Arthrodesis (>10 years)

BONE INFLAMMATION



ACUTE HEMATOGENOUS OSTEOMYELITIS

DEFINITION:

Acute nonspecific inflammation of cancellous tissue of bone & its medullary cavity

INCIDENCE: Male, Child, Low social class **إبن الزبال**

ETIOLOGY:

- Organism: Staph.aureus **(MOST COMMON ORGANISM)**
- Route: Blood
- PDF: General , Local

PATHOLOGY:

SITE:

- Which bone?! ... Around the knee, away from the elbow
- Where in bone ?! ... Metaphysis

PATHOGENESIS:

- Interosseous Hematoma & Interosseous Abscess:
(Sub-periosteal, in medullary cavity)
- Sequestrum formation, Involcrum, Cloaca

CLINICAL PICTURE:

	SYMPTOMS	SIGNS
General	FAHM	Fever, Tachycardia
Local	⊙ Pain ⊙ Swelling ⊙ PSEUDO-PARALYSIS	⊙ <u>Inspection:</u> Swelling ⊙ <u>Palpation:</u> Localized tenderness over the bone (EARLIEST SIGN), Sympathetic effusion of the adjacent joint ⊙ <u>Percussion:</u> Tenderness all over bone (DD: Cellulitis) ⊙ <u>Movement:</u> ♣ Loss of active movement ♣ PRESERVED PASSIVE MOVEMENT (DD: Septic Arthritis)

COMPLICATIONS:

- General: Toxemia, Septicemia, Pyemia (IF IMMUNOCOMPROMIZED)
- Local: Chronicity, Arthritis, ↓Bone growth, Pathological fracture

INVESTIGATIONS:

LABORATORY

- ⊖ CBC, ESR, CRP
- ⊖ Blood Culture at time of fever
- ⊖ **ASPIRATION FROM METAPHYSIS, C&S**

RADIOLOGICAL

- ⊖ **MRI (THE BEST)**, CT scan
- ⊖ **US** → sub-periosteal abscess, joint effusion,
U/S guided aspiration
- ⊖ **X-ray** → **NEGATIVE** < 2 weeks

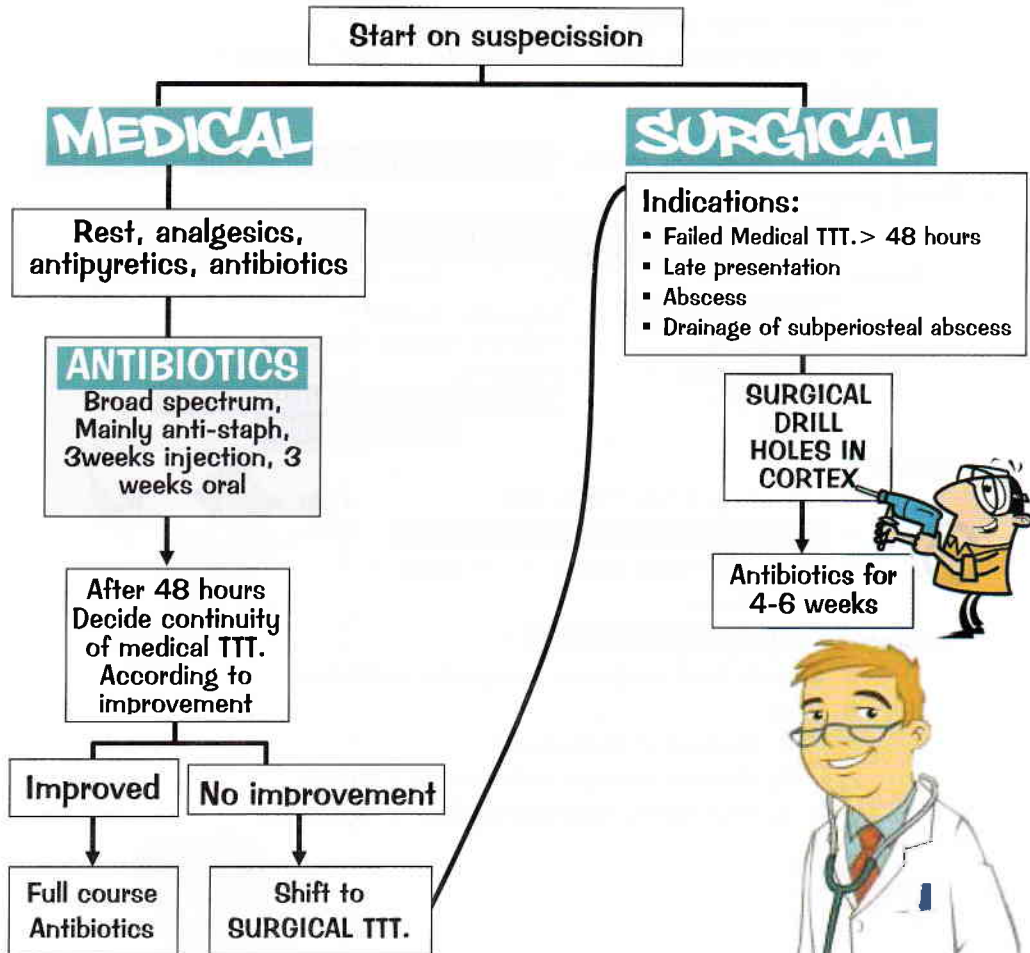
After 3 weeks:

CHRONIC FINDINGS

- ⊖ Cloaca
- ⊖ Sequestra
- ⊖ Involcrum



TREATMENT OF ACUTE HEMATOGENOUS OSTEOMYELITIS



CHRONIC NON-SPECIFIC OSTEOMYELITIS

Treatment

- ✓ Saucerization
- ✓ Sequestrectomy
- ✓ Sinusectomy
- ✓ Bone Graft

BRODIE ABSCESS

واحد كل يوم ينزل الصبح كويس لكن يرجع باليل يقول "آه يا رجلى" و يوم الأجازة يتوجع من الصبح ... السآ تاخذه على المستشفى و تشكى إنه متجوز عليها

- Bone Sclerosis & abscess cavity
- Evacuation → **APPLE JELLY MATERIAL "STERILE PUS"**
- Treatment: Saucerization & grafting



ACUTE PYOGENIC ARTHRITIS

✓ Incidence : **MIDDLE AGE**

✓ Etiology :

- Organism : Staph, strept. + **GONOCOCCI (STD)**
- PDF : General (Septic focus , low immunity) , Local (Trauma)
- Route :
 - Blood
 - Direct: Penetrating trauma , **ADJACENT ACUTE OSTEOMYELITIS** , **IATROGENIC**

✓ Clinical picture :

	SYMPTOMS	SIGNS
General	FAHM	Fever, Tachycardia
Local	NIGHT, REST PAIN ○ Swelling ○ Disturbance of function	○ Inspection: Swelling ○ Palpation: Hotness, Tenderness ○ Movement: COMPLETE LOSS OF ALL MOVEMENTS (ACTIVE, PASSIVE)

✓ Diagnosis :

- Laboratory: ↑TLC, ↑ESR, CRP
- **JOINT ASPIRATION ULTRASOUND GUIDED**
- X-ray: Soft tissue shadow + ↓Jt. Space
- U/S: Effusion

✓ Treatment (It's a **SURGICAL EMERGENCY**) :

℞ General: Rest, analgesics, antipyretics, antibiotics

℞ Local:

- 1) Washout of infected joint
- 2) If eroded Cartilage → Arthrotomy & Traction
- 3) If Completely separated Cartilage → Arthrodesis



MOST COMMON SITES FOR TB

✓ مفصل :

Hip joint

✓ عظام :

Vertebrae

✓ مكان :

Spine



TB OF SPINE "POTT'S DIS"

MOST COMMON SITE OF EXTRA-ARTICULAR TB



ETIOLOGY:

ORGANISM:

Mycobacterium
Tuberculosis

ROUTE:

2RY BLOOD BORNE
FROM LUNG TB

PDF:

Immuno-suppression

PATHOLOGY:

SITE:

- **MOST COMMON SITE IS DORSO-LUMBAR SPINE**
- **AFFECTS ADJACENT PARTS OF THE BODIES OF VERTEBRAE WITH THEIR DISCS**

MACROSCOPIC:

- Vertebral body is destroyed, replaced by caseous material
- Destruction of disc
- Collapse of the vertebrae

MICROSCOPIC:

TUBERCLES:

- 1- Epitheloid cells
- 2- Giant cells
- 3- Surrounded by Lymphocytes & Fibroblasts



**MORE COMMON
IN CHILDREN
PEAK <5 YEARS**

CLINICAL PICTURE

- GENERAL → TB Toxemia
- Clinical picture of Primary Focus (e.g. Pulmonary TB...)
- **DULL ACHING BACK PAIN MORE AT NIGHT (FIRST & MOST COMMON SYMPTOM)**
- **TRIAD OF ...**

COLD ABSCESS
+ **KYPHOSIS**
+ **PARAPLEGIA**



INVESTIGATIONS

IMAGING

- ♣ CT Scan, MRI
- ♣ X-ray:
 - 1) Early Osteoprosis
 - 2) Destruction of vertebral bodies
 - 3) Amalgamated intervertebral discs
 - 4) Kyphosis



LABORATORY

- ♣ CBC → Leukopenia with relative lymphocytosis ,
- ♣ ESR > 100
- ♣ Tuberculin +ve
- ♣ Sputum culture on Lowenstein Jensen media, PCR

COMPLICATIONS OF POTT'S DISEASE

COLD ABSCESS

Abscess collects under ant. Long. Ligament in front of vertebral body



- ♣ Cervical region → Retropharyngeal
- ♣ Thoracic region → Passes Intercostal spaces & Out from Lateral or medial forator
- ♣ Lumbar → Psoas abscess

PSOAS ABSCESS

Swelling in the Abdomin
+ swelling in the femoral triangle

CROSS FLUCTUATION SIGN ..

POTT'S PARAPLEGIA

EARLY

♣ REVERSIBLE

- OCCUR MORE WITH THE PERI-OSTEAL TYPE
- IN THE UPPER DORSAL REGION

LATE

♣ IR-reversible

ANGULAR KYPHOSIS

- OCCUR MORE WITH THE OSSEUS TYPE
- IN THORACIC REGION

TREATMENT OF POTT'S DISEASE

CONSERVATIVE

- ♣ Sanatorial
- ♣ Anti-tuberculous for 9 months:
 - Rifampicin + INH + Ethambutol for 2 months
 - Rifampicin + INH for the rest of course

FOR COMPLICATIONS

COLD ABSCESS

- ♣ Aspiration by Z-tech
- ♣ Open drainage :
 - 1) Chest → Costo-transversectomy
 - 2) Abdomen → Anterior approach

PARAPLEGIA

- ♣ Early : Arthrodesis
- ♣ Late : Conservative TTT for bed-ridden Pts.

BONE TUMORS

BENIGN

- ♣ **MOST COMMON BONE TUMORS**
- ♣ Discovered accidentally.
- ♣ C/O: Dull ache pain.
- ♣ Complications: Pathological fracture.



Most Common TUMOR .. of Bone :

⊙ **Benign tumors**

Most common MALIGNANT tumor of Bone :

⊙ **Secondary bone metastasis**

Most common PRIMARY bone tumor :

⊙ **In Children → osteosarcoma**

⊙ **In Adults → Multiple myeloma**

MALIGNANT

PRIMARY

- ♣ Osteoclastoma (Giant cell tumor)
- ♣ Osteosarcoma
- ♣ Ewing Tumor
- ♣ Multiple Myeloma

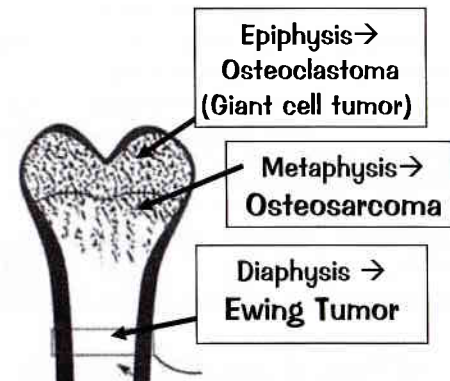
SECONDARY

2/3

Cancer Prostate
Cancer Breast

1/3

Others : thyroid,
lung ,GIT,kidneys



BENIGN BONE TUMORS

OSTEOCHONDROMA (EXOSTOSIS)

- MOST COMMON BENIGN TUMOR
- In **METAPHYSIS** of long bones
- May be Single or part of **GARDNER'S** (Sebaceous cyst, Dermoid cyst, FPC, Exostosis)
- **PRE-MALIGNANT** → **CHONDROSARCOMA**
(Low potentiality for malignancy)
- X-ray : **MUSHROOM APPEARANCE**
"Bony projection with cartilaginous capsule"
- TTT: Excision

CHONDROSARCOMA

- Middle age male
- Site → Pelvis, ribs, proximal long bones
- X-ray → Fluffy calcification
- TTT → Surgery (Resistant to radio, & Chemo)

EN-CHONDROMA

- **SHORT BONES** of hands & feet
- Central tumor
- **ENCHONDROMA OF SHORT BONES OF CHILDREN NEVER TURN MALIGNANT**
 - May single or Multiple enchondromatosis
"OLLIER'S DISEASE" (NOT FAMILIAL)
- TTT: **CHISELING**



MATT GREENING

OSTEOMA

IVORY OSTEOMA

in Skull

Painless

OSTEOID OSTEOMA

Any site except skull

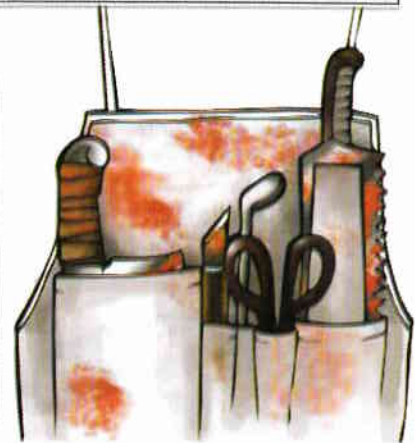
Most common

Diaphysis of Femur

Painful

BONE CYSTS

	SIMPLE BONE CYST	ANEURYSMAL BONE CYST
Incidence	MOST COMMON TYPE	
Site	Metaphysis of Upper Humerus or Femur	Metaphysis of long bones & Spine
Macro.	Cyst : filled with Straw colored fluid	Multiple Loculi filled with blood
Position	Central	Eccentric
TTT	curettage & Graft	curettage & Graft



		OSTEOCLASTOMA	OSTEOSARCOMA	EWING TUMOR
Incidence & Age		20-40, female	Most common primary tumor in children ▪ اعتلى يجمع في الكبار ؟	Most common in Age : 5-15 years
PATHOLOGY	Site	EPIPHYSIS Around Knee , away from elbow	On top of PAGET' Dis. Of Bones ▪ 80% Long bone ▪ 80% around Knee ▪ 80% METAPHYSIS	▪ DIAPHYSIS of Long bones ▪ Flat bones
	Cell of origin	UNKNOWN, thought to be Osteolytic	Osteoblasts	Round cell (BM reticulocytes)
	Macroscopic	brown, areas of Hemorrhage , necrosis	Purely osteoblastic (45%) or purely Osteolytic (30%)	منه Soft, grayish , brain like tissue
	Microscopic	Multi-nucleated giant cells	Malignant osteoblasts	وردة Rosette shaped cells
	Spread	LOCALLY MALIGNANT	Direct, Blood, Lymph ▪ Direct: invades medullary cavity (NO plug) ▪ Invades Cortex → Phantom bone ▪ Raise periosteum	▪ Direct ▪ Blood ▪ LYMPHATICS
C/O		▪ PAIN IS LATE ▪ PATHOLOGICAL FRACTURES ▪ Slowly progressive swelling	▪ PAIN IS EARLY ▪ PATHOLOGICAL FRACTURES ▪ Swelling	Similar to C/P of acute Osteomyelitis... with Constitutional symptoms " FAHM"
O/E	Inspection	Globular + stretched skin	Late swelling + dilated veins	Swelling + Congested skin
	Palpation	EGG SHELL CRACKLING SENSATION	Bone swelling + LNs	Swelling + LNs
	LNS	RARE	+ve	COMMON
INVESTIGATIONS	Diagnosis	✓ X-ray : 1) Eccentric tumor 2) SOAP BUBBLE APPEARANCE 3) Thin cortex + medullary plug ✓ Biopsy	✓ X-ray 1) ill-defined destructive lesion 2) SUN RAY APPEARANCE 3) CODMAN'S TRAIL ✓ Biopsy	✓ X-ray بصلة 1- ONION PEEL APPEARANCE 2- Biopsy
	Staging	CXR, CT	CXR, U/S	CXR, U/S
	Pre-op	Organ profile (CBC, KFT, LFT ...)		
TREATMENT		3 عظمات ✓ Important bone : ▪ Curettage + Graft ▪ Excision + re-construction ✓ Un-important → excision with safety margin ✓ Inaccessible → Radiotherapy	✓ Operable → Amputation + Chemotherapy ✓ Inoperable → Palliative chemo Recently : ✓ Pre-operative chemotherapy ✓ Excision + Micro-vascular graft from fibula & radius ✓ Post-operative chemotherapy	As Osteo-sarcoma... ✓ Chemotherapy ✓ Irradiation ✓ Surgery: - Amputation - Excision & Prosthetic replacement

SECONDARY BONE TUMOR

2/3: Cancer Prostate, Cancer Breast

1/3: Others (Thyroid, lung ,GIT, kidneys)

Site		RED MARROW → Trunk bones , root bones	
Incidence		MOST COMMON MALIGNANT BONE TUMOR	
Route of spread		♣ Systemic → Tissues which drain into SVC,IVC → Heart & Lung→ penetrate capillaries→ Systemic circulation ♣ Direct→ pelvic venous plexus & vertebral veins ♣ Invasion → Tumors of rectum spread into Pelvic bones	
		BONE SECONDARY	PRIMARY TUMOR
Symptoms		▪ Pain: PROMINENT ▪ Swelling ▪ Disturbance of function : ✓ Pathological fracture ✓ Hypercalcemia ✓ Spread to other tissue : hemoptysis ...etc	▪ Breast →Painless breast lump ▪ Prostate → Frequency , Difficulty, Sexual
Signs	General	Cachexia + signs of primary tumor	
	Inspection	Redness & Swelling	
	Palpation	Hotness, tenderness	
	Movement	Limited range of mobility	
	NVB	According to the site...	
Investigations		Palin X-ray: Osteolytic ... but (Osteogenic→ in Cancer Prostate) Bone scan (TC⁹⁹)→ Hot spots (to diff. from M.M.)	Breast : Mammography, US, FNABC Prostate : TRUS, Acid phosphatase
Treatment		☒ Palliative Radiotherapy ☒ Palliative Chemotherapy ☒ Treatment of Hypercalcemia : - Loop diuretics, Bisphosphonates	PALLIATIVE TREATMENT (stage IV, الورم في) ▪ Breast cancer→Hormonal ,chemotherapy +Palliative Mastectomy ▪ Prostate cancer→Hormonal therapy + Palliative TURP

MULTIPLE MYELOMA

Incidence		MOST COMMON TRY TUMOR IN ADULTS Age & sex: Most commonly in Old age راجل عجوز عنده وجع فى ظهره
Pathology	Site	Bones with hematopoietic BM : ○ Spine ○ Skull ○ Ribs, sternum
	Cell of origin	PLASMA CELLS
	Macroscopic	Marrow space is replaced by diffuse gelatinous Red tissue
	Microscopic	Sheets of plasma cells of malignant characters
	Spread	Wide spread
Clinical picture		☒ Pain " Backache" ☒ Pathological fracture ☒ Paraplegia ☒ Pallor Anemia ☒ Weight loss, infections ☒ Hypercalcemia... Weakness, fatigue, Lethargy N&V, constipation
Investigations		✓ <u>X-ray</u> → MULTIPLE OSTEOLYTIC LESIONS "Punched out" ✓ <u>Bone scan</u> : COLD SPOTS ✓ <u>CBC</u> : 1) Normocytic, normochromic anemia 2) ↑ESR > 100 mm/1 st hr. 3) Monoclonal Gammopathy 4) Hypercalcemia ✓ <u>Urine</u> : → BENCE JONES PROTEINURIA ✓ <u>BM aspirate</u> : → >20% PLASMA CELLS
Treatment		☒ Palliative Chemotherapy "Prednisolone + Malphalan " ☒ Spinal de-compression ☒ BM transplant ☒ Bisphosphonates for hypercalcemia ☒ TTT of anemia



PERTHE'S DISEASE

Definition:

- ✓ Avascular Necrosis of Femoral head الرأس ماتت
- الرأس رجعت بس المشكلة إن الولد بقى بيمشى
- هيشتكى من وجع فى الرجل و أحيانا فى الرجل السليمة اللي بيتتك عليها

Incidence & Etiology:

- ✓ 90% Unilateral
- ✓ Male Child (5-12 years) أم فى العشوائيات و بيجى فى آخر طفل خلفته
- ✓ Recently : may be due to thrombophilia

Pathology:

- ✓ Site → Hip joint
- ✓ Stages :
 - 1) Stage I : الموت ischemia, bone death
 - 2) Stage II : البعث revascularization & repair
 - 3) Stage III : العذاب Distortion & remodeling

C/O :

- ✓ Pain in hip ... referred to knee
- ✓ May last for 4 hrs after inactivity .. resolve and then return at night
- ✓ Pain may be sometimes in the unaffected limb اللي بيتتك عليها

Investigations:

- ✓ plain x-ray & aspiration of abscess (if there's septic arthritis)

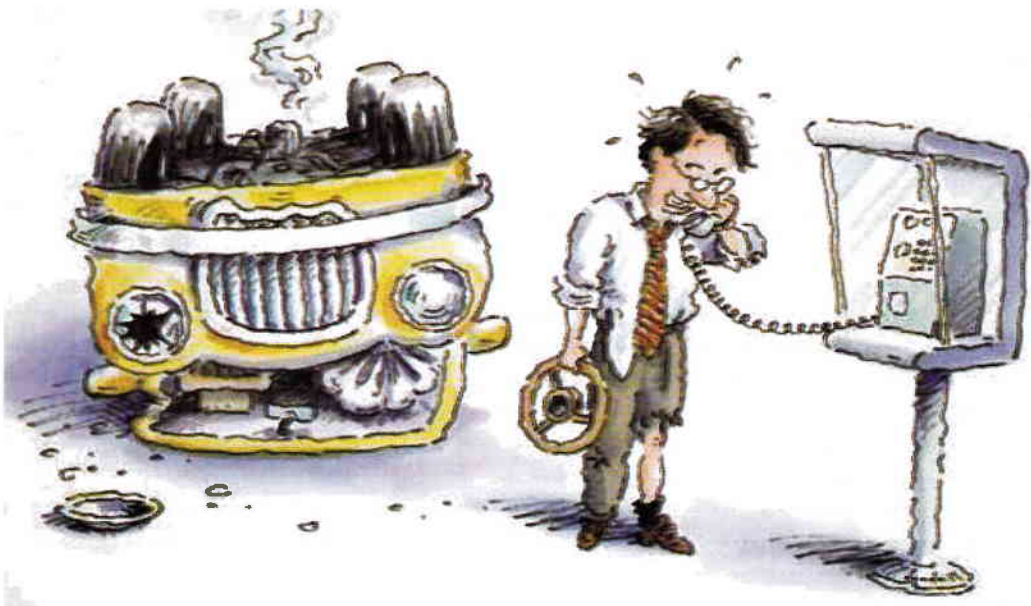
Treatment:

- ✓ Most cases (75%) resolve spontaneously within 2 years
- ✓ Non-surgical → minimize movement + fixation by abduction brace
- ✓ Surgical → TENOTOMY, OSTEOTOMY

- Sure signs of fracture: Deformity, length discrepancy, Crepitus, Abnormal movement
- There is 2 types of open {compound} fracture: 1ry {the trauma from outside cut the skin then fracture the bone}, 2ry {the trauma from inside ,bone fragment causes skin injury}
- The main complication of open fracture is INFECTION



- GUSTILO ITAL classification of open fracture:
 - Grade 1: low energy ,wound <1cm in length
 - Grade 2: wound > 1cm in length
 - Grade 3 :high energy wound with extensive tissue damage
 - ☐ 3A: Adequate soft tissue loss
 - ☐ 3B: Extensive soft tissue loss and bone damage
 - ☐ 3C: Associated with arterial injury
- Shoulder joint is the most common joint in the body to be dislocated due to: 1- Shallow glenoid cavity & large head of humerus
- 2- wide range of mobility 3- lax capsule & weak ligament
- The commonest fracture of the scapula involve the neck or the body of the bone
- Fracture surgical neck humerus usually occur in elderly patient associated with osteoporosis and its most important complication is axillary nerve injury
- Blood supply of femur head & neck:
 - 1- Extracapsular arterial ring
 - 2- Retinacular artery
 - 3- Artery of ligamentum teres
 - 4- Nutritional artery
- One of the most important complications of fracture both leg bones is compartmental syndrome





SURGI- TOONS

URO SURGERY



Michael Safwat
MBChB - Ain Shams University

URINARY TRACT TUMORS

- RENAL TUMORS
- URINARY BLADDER
TUMORS
- PROSTATIC TUMORS



"Did you switch my apple juice with a urine sample again?"

PRIMARY PARENCHYMAL RENAL TUMORS

	WILM'S TUMOR	HYPERNEPHROMA (RCC)
Incidence & Pathology :	10% of Childhood malignancy (3-4 years) - Carried on Chromosome 11 80% Differentiated	- Most common tumor of Renal parenchyma (75%, Age: 50-70 years) - Carried on chromosome 3
Site :	5-10% BILATERAL	2% BILATERAL
Macroscopic	✓ Star shaped mass, with areas of Hemorrhage, necrosis ✓ Grayish, pinkish white in color	✓ Mass with infiltrative edge, areas of hemorrhage, necrosis ✓ Golden yellow in color
Microscopic	- Mixed: Epithelial & Connective tissues - ORIGIN: Embryonic tumor	- Adenocarcinoma - ORIGIN: PROXIMAL CONVULUTED TUBULES
Spread	☒ Mainly BLOOD to lung → CANNON BALL ☒ Others : - Direct (EARLY TO CAPSULE) (Abdominal Mass is the main presentation) - Lymphatic (Uncommon) → Para-aortic بوعك	☒ Lymphatic → Para-aortic بوعك ☒ BLOOD - Lung (CANNON BALL) - Liver - To renal veins & IVC (FINGER IN GLOVES) 2nd VARICOCELE (UNILATERAL LEFT → BILATERAL) ☒ Direct (EARLY TO PELVIS) (Hematuria is the main presentation)
Patient C/O	Child, 4 years RAPIDLY PROGRESSIVE ABDOMINAL MASS (90%), PAIN Unusual presentation : ☒ Fever of Unknown origin (FUO) ☒ Unexplained loss of appetite & weight ☒ Hematuria → Late, bad prognosis ☒ Para-malignant \$ ☒ If bilateral → Uremia	Male, >40 years PAINLESS, PROFUSE, PERIODIC, TOTAL HEMATURIA (50%) ☒ Pain is late (40%) (Stretch of capsule, Passage of Blood Clot, Infiltration of adjacent Lumbar N.) ☒ Abdominal swelling (30%) ☒ Para malignant \$ (Hypercalcemia, polycythemia, amyloidosis) N.B. TRIAD OF HEMATURIA, PAIN, SWELLINGS REPRESENT 10% OF CASES
Investigations	✓ FOR DIAGNOSIS: - U/S (shows renal mass) & SPIRAL CT & Guided biopsy - IVU → spider leg appearance (elongated & displaced Pelvi-calyceal system) IVU In RCC → DEAD (Dilated, elongated, amputated, distorted) ✓ FOR STAGING → CHEST X-RAY (CANNON BALL) , Bone scan , U/S ✓ PRE-OPERATIVE INVESTIGATIONS → CBC, KFT, LFT	
Treatment	☒ OPERABLE TUMOR: Radical Nephrectomy ☒ INOPERABLE TUMOR: Preoperative Chemotherapy (To Shrink tumor to be removed) Remenant of tumor is marked by clips to facilitate <u>Post-operative radiotherapy</u>) <u>Post-operatively:</u> - If NO residual tumor → Adjuvant Chemotherapy (Actinomycin D, Vincristine) - If there's Residual tumor → Post-operative radiotherapy	☒ OPERABLE TUMOR: Total radical nephrectomy (Trans-peritoneal approach) + post-operative Interleukin-2 ☒ INOPERABLE TUMOR: - Palliative Nephrectomy - Interferon - Interleukin-2

PRIMARY MALIGNANT UB TUMORS

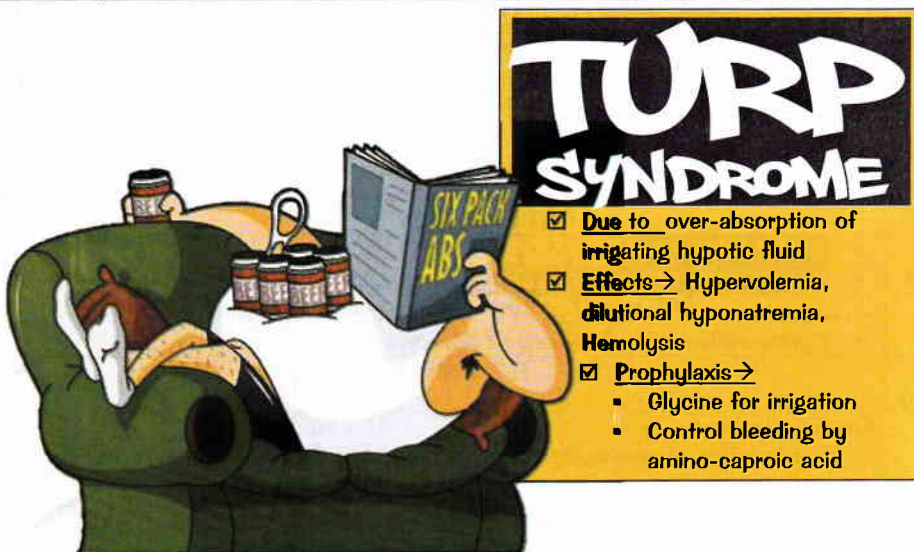
MOST COMMON UROLOGICAL MALIGNANCY IN EGYPT

	SQUAMOUS CELL CARCINOMA	TRANSITIONAL CELL CARCINOMA
PDF	✓ Irritation by Bilharzial ovum or stone ✓ Chronic inflammation by EColi ✓ Pre-cancerous lesions: Brunn's nests, Cystitis Cystica, Leukoplakia	✓ Chemical irritation by smoking, chemotherapy ✓ Industrial → Aniline dye ✓ Genetic: - RAS, C-erb B₂, P-53 (Lifraumini's \$)
PATHOLOGY	▪ SITE: Posterior & lateral wall (NOT IN TRIGONE) ▪ MAC: Fungating, ulcerative, infiltrative ▪ MIC: SCC→ Cell nests (If well differentiated)	▪ SITE: TRIGONE ▪ MAC: Papillary, ulcerative, nodule ▪ MIC: Superficial (75%), Muscle Invasive (25%), CIS
Spread	☒ Direct ... nearby organs ☒ Blood ... BLBL ☒ Lymphatic ... DELAYED in SCC	
Patient	MALE, 20-40 years	Male, >60 years
CLINICAL PICTURE	C/O: ✓ Painless terminal hematuria (In SCC→Hematuria is Painful) ✓ Necroturia ✓ Frequency, dysuria (In CIS→ Malignant cystitis) ✓ ABNORMALLY Recurrent attacks of UTI, Retention O/E: ✓ General signs → Signs of Malignancy (cachexia, anemia, Metastasis) ✓ Local signs→ Bimanual examination under GA (To assess local spread, staging)	
Investigations	✓ DIAGNOSIS: 1) Cysto-urethroscopy & Multiple biopsies 2) IVU → Irregularly filling defect (if # → Ascending Cystography) 3) U/S, CT , Urine analysis for cause ✓ STAGING: CXR, Bone scan ✓ PRE-OPERATIVE: CBC, ECO, KFT, LFT ...	
Treatment	CHEMORESISTENT, RADIORESISTENT Radical Cystectomy + Permanent urinary diversion	SUPERFICIAL BLADDER CANCER TRANS-URETHRAL RESECTION + MULTIPLE BIOPSIES ▪ If Grade II, III, CIS→ Intravesical chemotherapy, Immunotherapy ▪ If Recurrent, Persistent CIS→ Radical cystectomy MUSCLE INVASION BLADDER CANCER ▪ Radical cystectomy (With removal of the urethra) ▪ Radiotherapy ▪ Chemotherapy (MVAC)

PROSTATIC TUMORS

BENIGN PROSTATIC HYPERPLASIA		PROSTATIC CARCINOMA												
Nature	Benign	Malignant												
Etiology	UNKOWN... May be due to RELATIVE ↑Estrogen level	UNKOWN.. +ve Family History, Fatty meals, Black races												
Patient	Male > 60years													
Pathology														
site	- TZ (Peri-urethral glands)→ LATERAL lobe - CZ (Sub-cervical glands)→ MIDDLE lobe	Posterior Lobe → Outer zone												
Macroscopic	- Yellowish - Fibrous trabeculae dividing it into lobules - NO gritty sensation Diff. from cancer	- Grayish - Infiltrative Mass + Hge & necrosis - GRITTY SENSATION .												
Microscopic	hyperplastic acini CORPORA AMYLACIA (dried prostatic secretions)	ADENOCARCINOMA schirrous carcinoma rarely anaplastic												
clinical picture → May be asymptomatic														
symptoms	PROSTATISM : - Frequency of micturition (nocturnal→ day& night) - Difficulty to start , maintain , finish micturition - Sexual: Libido... Impotence كينج كونه نم إستشاري	- Prostatism - Pain - Occult manifestations (metastasis) - Complications												
signs	- Exclue complications & DD - Hydronephrosis→ mass or tenderness in renal angle - Retention → Supra-pubic palpable bladder - DRE <table><tr><th>" BENIGN ENLARGMENT "</th><th>" MALIGNANT ENLARGMENT "</th></tr><tr><th>BENIGN</th><th>MALIGNANT</th></tr><tr><td>soft & smooth</td><td>hard</td></tr><tr><td>symmetrical</td><td>Assymetrical</td></tr><tr><td>Preservation of: Median sulcus, Notch between Prostate& seminal vesicle</td><td>No preservation of sulcus or notch</td></tr><tr><td>Rectal mucosa is mobile</td><td>Early mobility and late fixation</td></tr></table>	" BENIGN ENLARGMENT "	" MALIGNANT ENLARGMENT "	BENIGN	MALIGNANT	soft & smooth	hard	symmetrical	Assymetrical	Preservation of: Median sulcus, Notch between Prostate& seminal vesicle	No preservation of sulcus or notch	Rectal mucosa is mobile	Early mobility and late fixation	- Mass or tenderness in Renal angle - Supra-pubic palpable bladder - DRE
" BENIGN ENLARGMENT "	" MALIGNANT ENLARGMENT "													
BENIGN	MALIGNANT													
soft & smooth	hard													
symmetrical	Assymetrical													
Preservation of: Median sulcus, Notch between Prostate& seminal vesicle	No preservation of sulcus or notch													
Rectal mucosa is mobile	Early mobility and late fixation													
Investigations														
For Diagnosis	- TRANS-RECTAL U/S - PSA (PROSTATIC SPECIFIC ANTIGEN) N:0-4ng/ml ... BPH <15, Cancer 15-30, Metastasis >30 - Cysto-urethroscopy & Biopsy → Adenoma													
pre-operatively	KFT, LFT, CBC, FBS, CXR, ECG													
Others	For complications: - laboratory →urine analysis, KFT - Instrumental: Uro-flowmetry →BNO	For Staging : - TC99, BM aspiration, CXR - X-ray spine OSTEO-SCLEROTIC												

	BENIGN PROSTATIC HYPERPLASIA	PROSTATIC CARCINOMA
Treatment	Mild C/O & No Complications → Medical TTT : ▪ AVOID 5Ws ▪ Alpha blockers (Prazosin) ▪ 5-alpha reductase inhibitors (Proscar) Severe C/O & Complications → Surgical TTT: Pre-operative : ☑ Antibiotics & TTT of any complications Intra-operative : ☑ TURP ☑ VLAP ☑ Transurethral prostatic vaporization ☑ Open surgery → Trans-vesical prostatectomy Post-operative : ☑ Irrigation by Saline Complications of operations : ☒ Retrograde ejaculation ☒ TURP Syndrome	Operable cases : Radical prostatectomy with Preservation of Bladder Neck, NV Bundle Inoperable cases : 1) Palliative TURP 2) Hormonal : ▪ Bilateral orchidectomy (or Orchiectomy) ▪ Estrogen (Phosphorylated DES) ▪ LHRH ▪ Anti-androgen METASTASIS : ▪ Radiotherapy ▪ Internal fixation of any fractures
Complications	▪ Acute Renal failure ▪ Psychological distress ▪ Hematuria (Rupture of vesical varices) ▪ Urine Retention 5W (Women, wine, winter, withhold of Urine, with infection) ▪ Back pressure (Urine retention, over-reactive UB, Chronic retention, residual urine, Bilateral hydronephrosis, Bladder stone, Cystitis)	SPREAD ☉ Direct : to pelvic organs ☉ Lymphatics : Internal iliac → Common iliac → para-aortic → thoracic duct → Virchow's LNs ☉ Blood : Bone → Lower vertebrae ▪ Hematuria ▪ Urine retention ▪ Renal failure ▪ Back pressure



URINARY TRACT INJURIES

- KIDNEY INJURIES
- URETER INJURIES
- URINARY BLADDER INJURIES
- URETHRA INJURIES



RENAL INJURIES

ETIOLOGY

- Open
- Closed
- Iatrogenic

RETRO-PERITONEAL

(Extra-peritoneal)

MOST COMMON TYPE

C/P :

- 1) Minimal shock
- 2) No Peritoneal irritation
- 3) Meteorism

(Abdominal distension after 24-48 hours due to hematoma)

INTRA-PERITONEAL

20%

- Infants
- Underdeveloped Gerota fascia & closely related peritoneum to kidney
- Previous pathology

PATHOLOGY

	Affects..	Leads to..
SUPERFICIAL TEAR	Cortex	Subcapsular hematoma , Perinephric abscess
DEEP TEAR	Medulla	Hematuria
COMPLETE TEAR	From capsule to renal pelvis	Perinephric hematoma & Hematuria
AVULSION		
SUBCAPSULAR HEMATOMA		

COMPLICATIONS

EARLY

- Anuria
- Bad general condition

LATE

- Pseudo-hydronephrosis
- Perinephric abscess
- Nephrotosis
- Hypertension
- Renal artery aneurysm

CLINICAL PICTURE

Symptoms

- History of trauma + Pain in flanks
- May be → Hematuria

HEMATURIA IS ABSENT IN:

- Superficial tear
- Avulsed pedicle
- Clot retention
- Traumatic anuria

Signs

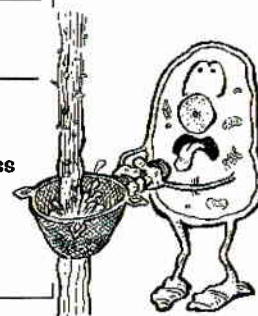
General examination

- Signs of Shock + associated injuries

Local examination:

IN THE LOIN..

- Inspection → ecchymosis, Bruises, Rigidity
- Superficial Palpation → Guarding
- Deep Palpation → Superficial tenderness, rebound tenderness
- Percussion → Shifting Dullness
- Auscultation → ↓ Intestinal sounds
- DRE → Fullness in retro-vesical pouch



MANAGEMENT POLYTRAUMATIZED PATIENT

FIRST AID → ABCD

PRIMARY SURVEY → ABCDE

SECONDARY SURVEY → Head
to toe exam + AMPLE History +
Resuscitation & monitoring

RESUSCITATION
& MONITORING

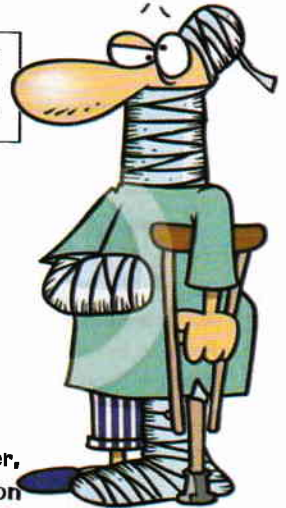
O2, Ryle, line, catheter,
fluids, Blood transfusion

INVESTIGATIONS
AFTER STABILIZATION OF PATIENT

- US → Perinephric hematoma
- CT scan, X-ray
- Pre-operative angiography



- For comp → CBC, KFT, LFT
- IVU → Medico-legal for the other kidney



DEFINITIVE TTT

RETROPERITONEAL HEMATOMA
عيان كويس و بطنه كويسة

OPEN INJURY, SEVERE SHOCK,
INTRA-PERITONEAL HEMATOMA,
PERITONITIS

CONSERVATIVE

- Anti-shock → Ryle, line, Catheter, fluids
- Analgesics, Abs
- Monitoring of Vital data
- IVU, U/S → for assessment

SURGERY

- Laparotomy
- Trans-peritoneal approach & Exclude injuries
- If small tear → Sutured
- Avulsion → Partial nephrectomy
- Completely depulped → Total nephrectomy

RUPTURE URINARY BLADDER

INTRA-PERITONEAL

راجل محزوق خبطته عربية

20%

- Acute abdomen all over abdomen
- Fullness in rectro-vesical pouch
- X-ray → Ground glass appearance

No desire to micturate in intra-peritoneal rupture, Catheter can be used



EXTRA-PERITONEAL

راجل وقع من البلگونه على قرافيصه

80%

- Acute abdomen in Suprapubic region
- Empty in rectro-vesical pouch
- X-ray → Fracture pelvis

COMPLICATIONS

- ☒ Pelvic abscess
- ☒ Delayed peritonitis
- ☒ Partial incontinence

TTT

- Poly-traumatized patient → Resuscitation & monitoring
- Treatment of Rupture bladder
 - ☒ Midline supra-pubic incision & Evacuate urine
 - ☒ Bladder is sutured with single layer of Polygalactin 910
 - ☒ Drainage → Suprapubic drain, Retro-Pubic drain - Catheter (Foley's Catheter is left for 5 days)

INJURIES TO THE URETHRA

EXTRA-PELVIC RUPTURE

راجل سقط على الخازوق

MOST COMMON TYPE

- C/O : Severe pain in Perineum
- O/E: Bladder is full
- If complete rupture → SC extravasation of urine

:: بول في الـ HOT SHORT ::



There's a desire to micturate, DON'T use Catheter



INTRA-PELVIC RUPTURE

DD: Extra-peritoneal rupture of bladder

- C/O: Acute abdomen in Suprapubic area
- O/E: Empty in rectro-vesical pouch
- DRE: Floating Prostate
- X-ray → Fracture pelvis

COMPLICATIONS

- ☒ SC Extravasation in complete rupture
- ☒ Stricture (extra-pelvic type)
- ☒ Stricture, Incontinence, Impotence (Intra-pelvic type)

TTT

- Poly-traumatized patient → Resuscitation & monitoring
- Supra-pubic Percutaneous cystostomy
- Urethral dilatation

URINARY TRACT INFLAMMATIONS

- PERI-NEPHRIC ABSCESS
- PYO-NEPHROSIS



PERI-NEPHRIC ABSCESS

DEFINITION: Suppuration of Peri-nephric fat & Fascia

ETIOLOGY:

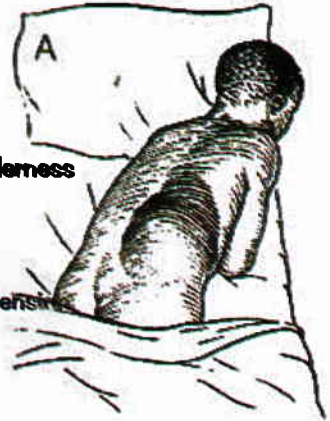
- **PRIMARY:** Blood born (rare) ... from distant septic focus
- **SECONDARY:** Direct spread (**MOST COMMON**) ...from Kidney, appendix, GB, Pleura, Peri-renal hematoma, TB of the vertebrae

CLINICAL PICTURE:

⊙ **SYMPTOMS:** FAHM + Pain & **HICCOUGH**

⊙ **SIGNS:**

- ♣ **GENERAL:** **HECTIC FEVER** , Tachycardia
- ♣ **INSPECTION:** ↓Abdominal movement
- ♣ **SUPERFICIAL PALPATION:** Guarding
- ♣ **DEEP PALPATION:** Loin Tenderness, Rebound **Tenderness**
- ♣ **SPECIAL SIGNS:**
 - ⊙ Pain & Swelling in Loin
 - ⊙ **SCOLIOSIS**
 - ⊙ **PSOAS SPASM:** Flexion of Hip & painful **extension**
مثل عارف يفرد رجله



INVESTIGATIONS:

- ♣ **ABDOMINAL U/S, CT** → Diagnostic & Therapeutic
- ♣ **CBC:**
 - ⊙ ↑ESR
 - ⊙ ↑↑TLC
- ♣ **PLAIN X-RAY**
 - ⊙ Scoliosis , obliteration of Psoas shadow
 - ⊙ Elevated fixed diaphragm
 - ⊙ X-ray spine → For Pott's disease

TREATMENT:

- ℞ Rest, Analgesics, Antipyretics, Antibiotics
- ℞ **U/S GUIDED PER-CUTANEOUS CATHETER DRAINAGE**
- ℞ If thick & Multi-Locular → Pus drainage through a lumbar incision+ C/S + Drain



PYONEPHROSIS

ETIOLOGY:

- Organism EColi
- Route ... ascending infection
- Predisposing factors ... Obstruction

TYPES:

- PRIMARY: infection → Obstruction كلية صغيرة و فيها حصاوى و صديد
- SECONDARY : obstruction infection كلية كبيرة و فيها حصاوى و صديد

CLINICAL PICTURE:

PYONEPHROSIS IS USUALLY UNILATERAL

- **PARTIAL OBSTRUCTION (OPEN TYPE)**
Chronic Toxemia, Renal swelling + 2ry cystitis
- **COMPLETE OBSTRUCTION (CLOSED TYPE) SURGICAL EMERGENCY**
 - General → Acute Toxemia
 - Local → Throbbing pain, Tenderness, Small swelling (swelling is large if 2ry obstruction)

COMPLICATIONS:

- General → Acute & Chronic Toxemia
- Local → Perinephric abscess, Acute Renal Failure

INVESTIGATIONS:

FOR DIAGNOSIS:

- CBC → ↑TLC, ↑ESR
- Urine analysis → Pyuria in open type
- U/S → Dilatation of renal pelvis & calyces
- Cystoscopy ... Chronic cystitis in open type, In Closed type; Ureteric catheter may be arrested at site of obstruction

FOR CAUSE:

- X-ray → Stone

FOR COMPLICATIONS:

- ARF → KFT, IVU

TREATMENT:

- GENERAL → Rest, Analgesics, Antibiotics, Antipyretics
- LOCAL :
 - OBSTRUCTED INFECTED KIDNEY:
Treated URGENTLY by Antibiotics, Kidney drainage by Nephrostomy tube or ureteric catheter
 - OPEN TYPE:
 - 1- IF KIDNEY IS FUNCTIONING: TTT. of the cause
 - 2- IF KIDNEY IS NOT FUNCTIONING: Nephrostomy
 - 3- IF KIDNEY IS STILL NOT FUNCTIONING: Nephrectomy provided that the other kidney is Normal
- TTT of Cause , TTT of Complications

URINARY TRACT STONES & OBSTRUCTIVE UROPATHY



URINARY STONES

PREDISPOSING FACTORS

Metabolic error

CALCIUM STONES

(OXALATE, PHOSPHATE STONES)

- Hyperparathyroidism
- Bone metastasis
- Idiopathic
- Hyper-vitaminosis D
- ↓ Urinary citrate
- Loss of terminal ileum (Crohn's dis, resection) = ↑OXALATE

CYSTINE STONE

- Cystinuria

URIC ACID STONE

- Gout , giant tumor lysis \$

Infection

Ecoli → Change PH of urine into alkaline

Others

- Diet
 - Milk → Calcium stones
 - Mango, tomato → Oxalate
 - Liver, kidneys → Urate
 - Eggs, meat, fish → Cystine
- Hot climate
- Randall's Plaque

INCIDENCE:

- 10-20% of population
- Male > Female
- Common in Middle age
- CALCIUM STONES ARE THE MOST COMMON TYPES, Followed by Phosphate, Urates

CALCIUM STONES

- MOST COMMON TYPE
- Etiology:
 - 1- HYPER-PARATHYROIDISM
 - 2- Bone Metastasis



TYPES

OCCPU

	OXALATE	CYSTINE	PHOSPHATE	URATE
Surface	SPIKY		Smooth	
Consistency	Hard	VERY HARD		Hard
Iry or 2ry		Iry	SECONDARY	Iry
Radio-		Opaque		LUCENT

PHOSPHATE STONE

- ⊕ TRIPLE PHOSPHATE (SRUVIATE)
(Formed of Ammonium, Mg , Ca)
- ⊕ Minimal symptoms
- ⊕ Stag horn stone

XANTHINE STONE

- ⊕ Smooth
- ⊕ Round
- ⊕ Laminated on cross section

CLINICAL PICTURE OF URINARY STONES

RENAL

SYMPTOMS:

- Dull aching pain in **FLANKS**
- C/O of complications

SIGNS:

- General → of Complications (e.g. Renal failure)
- Tender Renal swelling (Hydro or Pyo-nephrosis)

COMPLICATIONS:

- Painful hematuria (**TOTAL**)
- Infection → Pyonephrosis
- Migration → **Collo**

URETER

SYMPTOMS:

- Severe **COLICKY PAIN** in **LOIN** radiating to **GROIN**
- Sudden onset, Short duration (<8 hours)

SIGNS:

- Rigidity in Lateral abdominal muscles

COMPLICATIONS:

- **TOTAL HEMATURIA** (May occur after an attack of ureteric colic)

BLADDER

SYMPTOMS:

- **FREQUENCY BY DAY (EARLIEST)**
- **SUPRA-PUBIC PAIN**
 - Referred to the tip of penis or Vulva
 - At the end of micturition
 - ↑ during day & movement
 - ↓ by lying down

SIGNS:

- Suprapubic tenderness

COMPLICATIONS:

- **TERMINAL HEMATURIA**

URETHRA

MIGRATORY STONE

BALL VALVE EFFECT

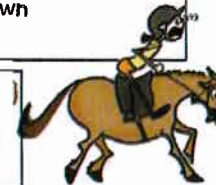
- History of renal colic 2-3 days ago
- During last micturition → Sudden arrest of urine → Leads to Acute Retention

SIGNS

- Stone May be felt on undersurface of penis

COMPLICATIONS:

- **INITIAL hematuria**
 - Not related to Micturition



LOIN TO GROIN PAIN

- Renal, ureteric calculi
- Infection (pyelonephritis, cystitis with ascending infection)
- Hydronephrosis
- Renal cell carcinoma
- Carbuncle of the kidney

COMPLICATIONS

HIMOM

Hematuria, infection, Migration, Obstruction, Malignancy

H

HEMATURIA

- Total Renal, ureteric
- Terminal...UB
- Initial...Prostatic Urethral
- Not related to micturition Distal Urethral

I

INFECTION

- **PYELO-NEPHRITIS :**
 - a) Loin pain
 - b) Fever, Rigors
 - c) Frequency, dysuria
- **PYONEPHROSIS :**
 - a) Painful loin swelling
 - b) Constitutional symptoms
- **CYSTITIS :**
 - a) Supra-pubic pain
 - b) Frequency
 - c) Dysuria

M

MIGRATION

Change of Character of pain

O

OBSTRUCTION

M

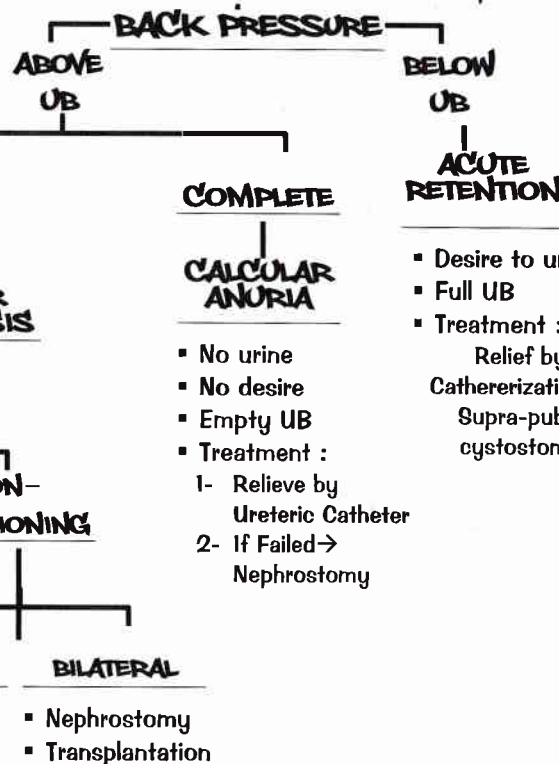
MALIGNANCY

SCC on top of Leukoplakia



CLINICAL PICTURE OF COMPLICATIONS

- **ARF:** Anorexia, Hiccough, Anemia, bleeding, Coma
- **Infection:** Painful hematuria , Pyuria
- **Obstruction:**
 - 1) Retention: Anuria
 - 2) Obstruction of ureter: Severe persistent pain



INVESTIGATIONS FOR DIAGNOSIS

PLAIN X-RAY (KUB) FILM

POSTERO-ANTERIOR VIEW, LATERAL VIEW

U/S

URINE EXAM

- RBCs
- Crystals

Radio-opaque

- Oxalate
- Phosphate
- Cysteine

Radio-Lucent

- Urate stone

During attack or
if impaired KFT

ASCENDING UROGRAPHY

In between attacks
(After 10 days), If KFT
are normal

INTRAVENOUS UROGRAPHY (IVU)

- Stone → Filling defect
- Back pressure
- Differential function

IF RECURRENT OR BILATERAL INVESTIGATIONS FOR THE CAUSE

- Serum Ca^{+2} , phosphorus, parathyroid hormone
- Stone analysis
- Uric acid
- Urine salts

IF COMPLICATED INVESTIGATIONS FOR COMPLICATIONS

- Urine analysis
- KFT



OTHERS:

⊖ CYSTOSCOPY

- BLADDER stones
- Bloody efflux from ureteric orifice, Impacted stone

⊖ DMSA SCAN

TREATMENT OF URINARY STONE

DURING ACUTE ATTACK

- Admission
- Analgesics → Declofenac IV (Voltaren)
- Anti-spasmodics (Buscopan)
- Antibiotics

DEFINITIVE TREATMENT

After Resolution of attacks or accidentally discovered stones

CONSERVATIVE

Small < 0.5 cm
No complications

- Ample fluids
- Antispasmodics
- Antibiotics
- Alkalanization or acidification of urine

ACTIVE MANAGEMENT

- Failed conservative TTT
- If complicated stones
- If > 0.5 cm

WE HAVE TO TRY
INSTRUMENTAL TTT.
FIRST & IF FAILED →
DO SURGERY

COMPLICATIONS

See later

SPECIAL

Recurrence

↑↑ H₂O intake
+ TTT of cause

Bilateral Stones

Treat better
functioning kidney
then the other
after 2-3 months
Multiple stones
at multiple levels

RENAL

1-2 cm

ESWL

> 2 cm

PCNL

- RENAL → Nephro-lithotomy
- PELVIC → Pyelo-lithotomy
- STAG HORN → Extended Pyelo-nephro-lithotomy

URETER

Upper 1/3

Push Bang
technique

Pyelo-
lithotomy
(MORRIS)

Middle 1/3

Push bang
technique

Uretero-
lithotomy
(ABERNATHY)

Lower 1/3

Dormia basket,
Double J stent

Uretero-
lithotomy
(PFANNESTIEL)

BLADDER

1-2 cm

Cystoscopic
lithoplaxy

Percutaneous
supra-pubic
lithoplaxy

> 2 cm

Supra-pubic
Cysto-lithotomy

URETHRAL

OBSTRUCTIVE UROPATHY

DEFINITION: Obstruction anywhere in the urinary tract associated with changes in the urinary system proximal to the obstruction

PARTIAL

IN URETER
HYDRONEPHROSIS

IN URETHRA
CHRONIC RETENTION



Normal Kidney



Mild



Moderate



Severe

COMPLETE

IN URETER
CALCULAR
ANURIA

IN URETHRA
ACUTE
RETENTION



HYDRONEPHROSIS

DEFINITION:

- Aseptic dilatation of Pelvi-calyceal system due to intermittent obstruction

ETIOLOGY:

UNILATERAL	BILATERAL
▪ Stones ... Renal TB ▪ Pelvi-ureteric junction obstruction ▪ Horseshoe kidney, Aberrant renal vessels ▪ Ureterocele	▪ BPH ▪ Congenital contracture of Bladder Neck ▪ Bilharziasis ▪ Phimosis

PATHOLOGY:

- Extra-renal Pelvis
- Intra-renal Pelvis

CLINICAL PICTURE:

- Dull aching loin pain, ↑ by fluid intake, O/E → palpable kidney
- Clinical picture of Etiology:
 - 1) Stone → Colic, hematuria
 - 2) BPH → Prostatism
 - 3) TB → Toxic symptoms, frequency
- Clinical picture of Complications:
 - 1) Infection → Hypertension & Fever
 - 2) ARF → if bilateral hydronephrosis, or Unilateral with one functioning kidney

INVESTIGATIONS:

- U/S → size of kidney, thickness of cortex
- IVU → Flattening, Clubbing, Ballooning
If IVU is # → Ascending Pyelography
- For cause → TRU/S, Cystoscopy
- For complications → KFT, Urine analysis, CBC

TREATMENT

UNILATERAL

FUNCTIONING

TTT of cause

NON-FUNCTIONING

Nephrectomy

BILATERAL

FUNCTIONING

TTT. Of better
functioning
kidney

NON-FUNCTIONING

Nephrostomy

- If improved → TTT. Of better functioning kidney
- If not improved → Renal transplantation

+ Re-construction by "ANDERSON – HYNES OPERATION"
or Recently by "ENDOSCOPIC PYELOLYSIS"

TTT OF CAUSE:

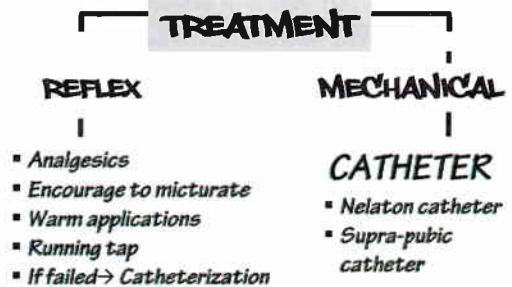
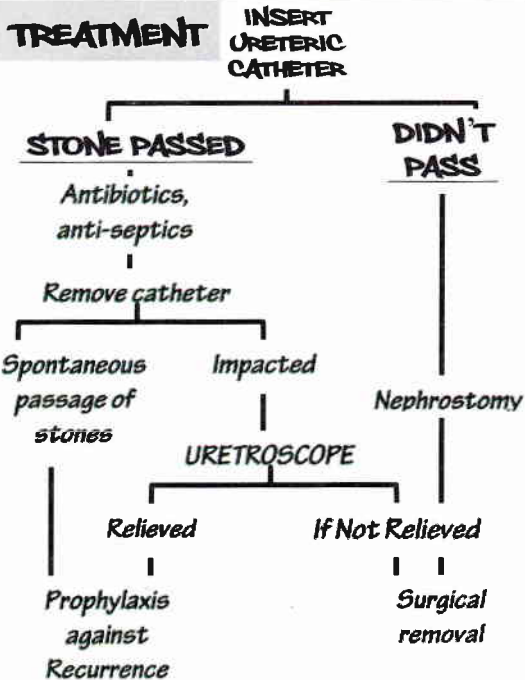
- Stones → Removal
- BPH → TURP
- Phimosis → Circumcision

TTT OF COMPLICATIONS:

- ARF → Transplantation
- Pyo-nephrosis → Drainage, Antibiotics

COMPLETE OBSTRUCTION

	CALCULAR ANURIA	ACUTE RETENTION
ETIOLOGY	▪ Bilateral obstruction ▪ Unilateral obstruction (If other kidney is congenitally absent, surgically removed or pathologically destroyed)	▪ BPH ▪ Stone ▪ Trauma ▪ Reflex (Post-operative), Psychological
CLINICAL PICTURE SYMPTOMS	STAGE OF ONSET: ▪ Ureteric colic ▪ Tender Renal angle ▪ Empty UB ▪ No Urine, No desire	▪ Retention → Supra-pubic pain, Inability to pass urine inspite of desire, Symptoms of cause → Stone, BPH, History of trauma
SIGNS	STAGE OF TOLERANCE (3-8 days): ▪ Pain gradually disappears, ↑ Blood urea STAGE OF UREMIA (after few days)	▪ SIGNS: Kidney → Loin swelling
INVESTIGATIONS	CATHETER + ...	DONE AFTER RELIEF OF OBSTRUCTION
EMMERGENCY INVESTIGATIONS	☑ Plain X-ray , U/S ☑ Ascending pyelography ☑ Cystoscopy N.B.... IVU is #	☑ Pelvic U/S ☑ For Cause: Stones → X-ray, BPH → TRUS



TTT OF CAUSES:

- Stones, BPH, Stricture



CHRONIC RETENTION OF URINE

ETIOLOGY:

- Urethral Stricture, BPH, BNO, Tumors

CLINICAL PICTURE:

- Symptoms → Painless UB swelling, Frequency
- Signs → Full UB, Not tender

INVESTIGATIONS:

- ⊖ Pelvic U/S
- ⊖ UREA LEVEL
- ⊖ For cause
- ⊖ For complications

TREATMENT:

- FOLEY's CATHETER

If urea > 100 mg% → GRADUAL EVACUATION

- TTT of cause ... DRE, BPH
- TTT of Complications ... Hydronephrosis, Tender loin mass



OBSTRUCTIVE UROPATHY IN CHILDREN

ETIOLOGY:

- PUJ
- Uretero-Vesical junction obstruction
- Post. Urethral valve
- Stones

CLINICAL PICTURE:

- Abdominal pain + Abdominal swelling (Hydronephrosis, or distended UB)
- Clinical picture of complications → UTI, Hematuria

INVESTIGATIONS:

- ⊖ Plain x-ray
- ⊖ U/S
- ⊖ DMSA scan
- ⊖ Micturating cysto-urethrogram
- ⊖ IVU



CONGENITAL ANOMALIES

- RENAL ANOMALIES
- URINARY BLADDER ANOMALIES
- URETHRAL ANOMALIES



RENAL ANOMALIES:

SOLITARY CYST OF KIDNEY

- ✓ **BENIGN CYST: (3F)**
 - a) Clear fluid
 - b) Flat epithelium
 - c) fibrous septa
- ✓ **Clinical Picture:**
 - Asymptomatic
 - Loin pain, Swelling
 - Complications: As any cyst (Hemorrhage, infection, calcification..)
- ✓ Best investigation is U/S.....
- ✓ If Small cyst → **CONSERVATIVE TTT.**
- ✓ If Large or Complicated → **SURGICAL TTT:**
Aspiration, Marsupilization, Partial Nephrectomy

CRITERIA OF BENIGN CYST ON US

- ✓ Smooth wall
- ✓ Clear fluid
- ✓ NO fibrous septae
- ✓ No Malignant cells on aspiration
- ✓ No residual mass after aspiration

PTOSED KIDNEY

- ✓ Etiology: رجيم قاسى .. حمل كثير .. كورسيه
- ✓ Clinical picture: Mainly Asymptomatic + **3D**
 - 1) Duodenal traction
 - 2) Dragging loin pain
 - 3) **DEITEL'S CRISES**
- ✓ Best investigations is IVU: during full inspiration & Expiration → Mobility > 1 vertebrae
- ✓ Best treatment is **CONSERVATIVE**
(Weight gain, exercises, avoidance of corset)
- ✓ If failed → Nephropexy

DEITEL'S CRISES

- ✓ Loin pain + Hematuria

CONGENITAL POLYCYSTIC KIDNEY:

- ✓ Adult type (AD) IS MORE COMMON THAN Infantile type (AR)
- ✓ May be associated with cystic changes in the body (IC aneurysms, Liver cysts)
- ✓ **PATHOLOGY:**
 - **SITE:** Always bilateral
 - **MACROSCOPIC PICTURE:** Multiple cyst **NOT CONNECTED TO RENAL PELVIS**
 - **MICROSCOPIC PICTURE:** Content → Amber clear fluid
- ✓ **CLINICAL PICTURE:**
 - Asymptomatic till 2nd -3rd decade
 - At age of 30 → Dull aching pain in the flanks, irregular loin swellings, Complicated by **RENAL HYPERTENSION (75%)**, Hematuria, infections.
- ✓ Best investigation is U/S , CT scan → Multiple cysts in both kidneys
- ✓ Screening is done by US for family members > 20 Yrs
- ✓ **Treatment :**
 - ✎ **SURGICAL** → Rovesing operation (marsupilization)
 - ✎ **IF RENAL FAILURE OCCURS** → Kidney transplantation

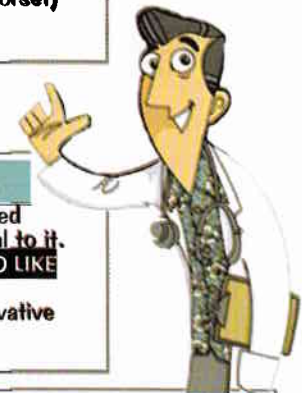
URETROCELE

- ✓ Stenosis of Ureteric Orifice → dilated intramural part + swelling proximal to it.
- ✓ Investigations : IVU : **ADDER HEAD LIKE**
- ✓ Treatment:
 - Asymptomatic → Conservative
 - Cystoscopic meatotomy

MOST COMMON ANOMALY OF THE UPPER RENAL TRACT IS " DOUBLE PELVIS = BIFID PELVIS"

FLOATING KIDNEY:

Can be pushed in ALL directions & to the renal angle, could be complicated with torsion & Gangrene



URINARY BLADDER ANOMALIES

ECTOPIA VESICAE (= EXSTROPHY)

- ✓ Male > Female (4:1)
- ✓ **CLINICAL PICTURE:**
 - Absence of lower abdominal wall + Ant Bladder wall
 - Widening of Symphysis pubis → Waddling gait
 - Genitalia : عصبية لحين إشار آخر
 - Epispadias (EXTROPHY – EPISPADIUS COMPLEX)
 - Rudimentary prostate, Seminal vesicles, penis
 - Bifid scrotum
 - Bilateral undescended testes
 - Bilateral Inguinal hernia
 - Associated anomalies (e.g. Spina bifida, Cleft lip)
- ✓ **Complications:**
 - Cystitis & Ascending pyelonephritis
 - Skin Excoriation, Ulcer, bleeding, bad odour
 - Bladder Carcinoma (chronic irritation)
- ✓ **Investigations :** plain x-ray (Wide separation of symphysis pubis), IVU (For associated Urinary tract anomalies)
- ✓ **Treatment :**
 - ✎ Temporary closure of defect at birth
 - ✎ Bladder augmentation later + Pelvic corrective osteotomy + phyloplasty
 - ✎ If continence cannot be preserved → permanent diversion

DIVERTICULAE

CONGENITAL	ACQUIRED
	PULSION diverticulae
	MALE > 50 YRS
Solitary: MIDLINE, ANTERO-SUPERIOR	Multiple
Contain Muscle Fibers Within its wall → Contractile	NO muscle fibers within the wall → Doesn't empty during micturition
CLINICAL PICTURE:	
- Male > 50 years, Accidental discovery on U/S - CONGENITAL DIVERTICULA: Empty during Micturition "DOUBLE MICTURATION" - OF COMPLICATING: Frequency, Pain, Hematuria	
MOST COMMON COMPLICATIONS : INFECTION, STONES	
Malignant transformation "SQUAMOUS METAPLASIA " (<5%)	
Investigations: Cystography, Cystoscopy	
Treatment → TTT. of the cause, Diverticulectomy if complicated	

BLADDER NECK OBST. (BNO) MARION'S DISEASE

- ✓ **PATHOLOGY:**
 - 1- Hypertrophy of Internal sphincter with development of vesical diverticulae (**MARION'S DISEASE**)
 - 2- Fibrosis of tissues of Bladder neck
- ✓ **Investigations :** Uro-dynamic study → Raised voiding pressures, ↓ Flow rate
- ✓ **Treatment :**
 - Alpha blocking drugs "Prazosin", Surgical " Trans-urethral incision of bladder neck"

HYPOSPADIUS

- ✓ **DEFINITION:** Urethra opens on undersurface of Penis , perineum
- ✓ **MOST COMMON ANOMALY OF URETHRA, +VE FAMILY HISTORY (8%)**
- ✓ **TYPES & ETIOLOGY:**

:: MOST COMMON TYPE IS GLANULAR TYPE::

GLANULAR TYPE	PENILE TYPE	PERINEAL TYPE
EUM opens on undersurface of Glans penis	EUM opens on undersurface of shaft of the penis, Distal part of urethra is replace by fibrous fissure (URETHRAL CHORDAE)	Scrotal skin is split, Urethra opens in-between, Penis is rudimentary within undescended testes
Failure of recanalization of urethra of glans penis	Failure of fusion of inner urethral folds	Failure of development of whole penile urethra

- ✓ **Clinical picture depends on Age :**
 - ♣ At birth → مطاهرة الملائكة → hooded prepuce
 - ♣ 2-10 years → أبو شنة → Wetting clothes in micturition
 - ♣ After puberty → مبيخلفش → Bowed penis downwards during erection
- ✓ **Investigations :**
 - Hormonal assay & karyotyping ... For associated conditions
 - Ascending urethrogram post-operatively ... to asses success of surgery
- ✓ **Treatment :**

CIRCUMSISION لا تكمل عمل الملائكة

- ⌚ **Timing :** 6-18 months
- ⌚ **PRE-OPERATIVE** → Removal of Chordae, injection of saline for erection
- ⌚ **OPERATION** → Urethral reconstruction (recently: artificial tube)
 - 1) **GLANULAR** → MAGPI operation
 - 2) **PENILE** → DUKETTE operation
 - 3) **PERINEAL** → UB mucosal flap
- ⌚ **POST-OP** → Circumcision

URETHRAL ANOMALIES

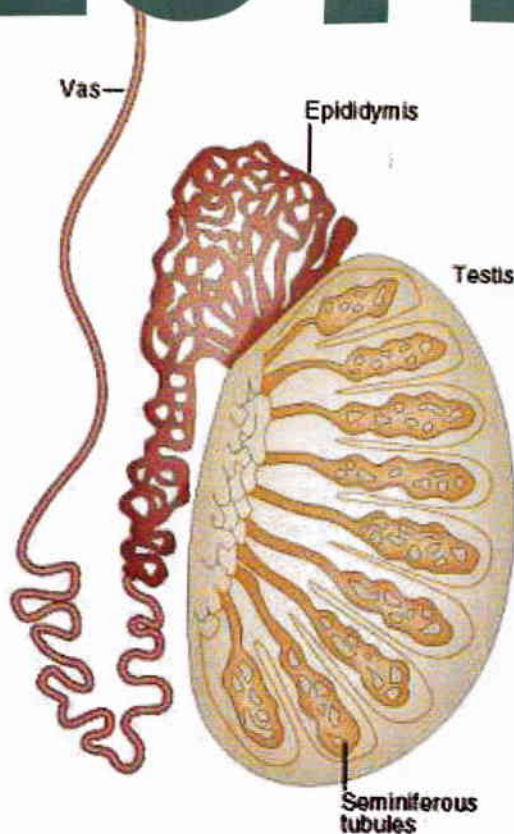
PHIMOSIS

- ✓ **Contraction of Prepuce**
→ **NOT RETRACTING OVER GLANS**
- ✓ **CLINICAL PICTURE:** PIN HOLE MEATUS + urinary obstruction
- ✓ **Congenital or acquired**
"BALANITIS XEROTIC OBLITERANS"
- ✓ **TTT:** Circumcision

VESICO-URETERIC REFLEX

- ✓ **Diagnosed by:**
 - Micturating Cysto-urethrogram "MUC"
(Distended posterior urethra, VUR, Bladder trabeculae)
 - U/S
(Dilated, Pelvi—calyceal system, thinning of cortex, distended UB, dilated ureter)
 - DMSA scan

TESTIS



TESTICULAR TORSION VS. ACUTE EPIDIDYMO-ORCHITIS

	TESTICULAR TORSION	ACUTE EPIDIDYMO-ORCHITIS
Etiology	Predisposing Factors: ▪ MOST COMMON: INVERSION OF TESTIS (anterior > Polar) ▪ Imperfectly descended testis ▪ Long mesochorium ▪ High investment of Tunica vaginalis ▪ Spirally attached cremasteric ms. ▪ Separation of Epididymis from body of testis Precipitating factors : ▪ Sudden strain ▪ MILD TRAUMA	Organism : ▪ STREPT., Ecoli, staph. ▪ CHLAMYDIA Most common sexually transmitted cause Route of infection : ▪ Along <u>Vas</u> , <u>Peri-vasal LNs</u> , via <u>blood stream</u> Predisposing factors : ▪ Urinary tract infection ▪ Mumps
Clinical picture :		
Patient	Infant or adult 15-25 yrs	Adult or Elderly
C/O:	Sudden severe pain in scrotum, lower abdomen NOT relieved on elevating scrotum ✓ Testicular swelling ✓ Reflex symptoms → N, V, collapse	Acute painful scrotal swelling, Relieved by elevating scrotum ✓ Etiology → Dysuria, FAHM
O/E:	✓ GENERAL: Pallor, sweating, tachycardia ✓ Due to imperfect Descended Testis: → Empty scrotum, swollen Inguinal canal ✓ On top of Complete Descended Testis: 1) Scrotum : swollen, tender testis , Elevation of scrotum increase pain 2) Cord : twisted 3) Testis : high, tender, associated Hydrocele 4) Cremasteric reflex is LOST .	✓ GENERAL: Fever ✓ LOCAL: ✓ Scrotum : red , inflamed skin ✓ Epididymis : Enlarged , tender ✓ Associated hydrocele ✓ If abscess is formed → Pus locus
Complications	Gangrene within 6-12 hours	Testicular abscess, Atrophy, chronicity
Invest.	☒ Doppler, Duplex → Obstructed blood flow in testicular vessels ☒ Urine analysis → Free	☒ Doppler, Duplex: Testicular vessel is PATENT ☒ Urine analysis → Pus cells
TTT	☑ IN THE FIRST HOUR: untwist using gentle manipulation ☑ Correct general condition ☑ Emergency treatment in early cases : Untwist cord → Orchiopexy → Eversion of Tunica → Orchiopexy of other testis ☑ if late cases : Orchiectomy & orchiopexy of other testis	☑ Prophylactic : Proper TTT of UTI . If chlamydia → Doxycycline 100 mg ☑ Active TTT : 1) Rest (elevation of scrotum), Antibiotic, analgesics, antipyretics 2) If abscess is formed → Drainage

HYDROCELE

DEFINITION: Collection of fluid in a part of processus vaginalis

HYDROCELE OF TUNICA VAGINALIS

CONGENITAL

Due to persistence of processus vaginalis

- ☑ Sac connects with peritoneum
- ☑ Mother complains that her baby has a **Scrotal Swelling + CHANGE IN SIZE** by day & night

- ☑ Signs → Swelling :
 - 1) Inguino-scrotal
 - 2) Cystic (Bipolar test)
 - 3) Translucent
 - 4) Non-reducible

- ☑ Treatment :
Conservative TTT for 6 months
If no spontaneous improvement occurs →
Excision of sac till internal ring

INFANTILE

- ☑ Sac has NO connection with peritoneum
- ☑ Mother complains that her baby has a **Scrotal Swelling + NO CHANGE IN SIZE**

- ☑ Signs → Swelling :
 - 1) Inguino-scrotal
 - 2) Cystic (Bipolar test)
 - 3) Translucent
 - 4) Non-reducible

- ☑ Treatment :
Eversion of Tunica

1st VAGINAL

INCIDENCE

- Middle aged male
- Fluid is Exudative

CLINICAL PICTURE

- ☑ C/O : painless swelling in one of the scrotal compartments
- ☑ O/E → **SWELLING**:
 - Unilateral
 - **PURELY SCROTAL**
 - Non-tender
 - Cystic, translucent

INVESTIGATIONS

- Clinically diagnosed
- Investigations are done in cases of **rapidly accumulating hydrocele**

TREATMENT

- 1) **LORD'S OPERATION:**
Plication of tunica vaginalis
- 2) **Sub-total excision of Tunica vaginalis** in cases of calcified, loculated, and recurrent.
- 3) **Eversion** for small hydrocele

N.B. ASPIRATION IS # Except if bad general condition as it may lead to hematocele, pyocele, recurrence, injury of testis

OF SPERMATIC CORD

- ☑ Encysted hydrocele of cord
" See DD with spermatocoele "
- ☑ Hydrocele of hernia sac
- ☑ Diffuse hydrocele of cord

DIFFUSE HYDROCELE OF CORD Etiology:

Chronic lymphatic obstruction "**FILARIASIS**"

Clinical picture → **LYMPHOCELE**

- **Bilateral**
- Inguino-scrotal
- (No expansile impulse on coughing)
- Cystic, Translucent
- Irreducible
- Soft
- Dull
- Diffuse
- Funiculitis is common

HYDROCELE OF CANAL OF NUCK

- ☑ In females
- ☑ Cyst in relation to **ROUND LIGAMENT**
- ☑ In inguinal canal



Complications of Hydrocele:

- ☑ Hernia of hydrocele sac
- ☑ Hematocele (during tapping)
- ☑ Infection, rupture, calcifications
- ☑ Bilateral cases → Atrophy of testis

VARICOCELE

SURGT-TOONS: Uro— surgery PAGE 171

DEFINITION: varicosity of pampiniform & cremasteric plexuses of veins

PRIMARY

INCIDENCE

- Age : bet. Puberty -35 year
- **Left side > Right**

ETIOLOGY

- ☒ **PREDISPOSING FACTORS:** Congenital mesenchymal weakness
- ☒ **PRECIPITATING FACTORS:** ↑Venous pressure (prolonged standing , straining, venous congestion)

CLINICAL PICTURE

- ☒ C/O : usually asymptomatic, Pain, scrotal swelling
- ☒ O/E : Swelling :
 - **Left side hangs lower than right**, Scrotal skin show dilated veins
 - Palpation :
 - 1) Scrotal neck test → Fullness at neck of scrotum
 - 2) **Bag of worms** which gives a thrill on coughing → disappear when patient lies down with elevation of scrotum
 - 3) Associated with a small lax 2ry hydrocele
 - 4) To differentiate from SECONDARY varicocele → Thrill on cough

INVESTIGATIONS

- ☒ **Semen analysis** → Stress pattern (asthenospermic, Oligospermic) .. for medico-legal importance ..
- ☒ **Duplex scan** → reversed blood flow bilaterally
- ☒ **Scrotal, trans-rectal U/S** → for visualization & Grading
- ☒ **Abdominal U/S** → exclude 2ry varicocele (Hypernephroma)

TREATMENT

- ☒ **CONSERVATIVE** → Psychological support, Scrotal support, Cold bath to scrotum, avoid constipation & pelvic congestion
- ☒ **OPERATIVE TREATMENT** → Inguinal approach, Retro-peritoneal approach → **"PALOMO OPERATION"**, Laparoscopic Varicos-electomy, Percutaneous venous embolization

كلمة السر "Left testicular vein + supra-renal gland"

- Left Supra-renal gland secretes **ADRENALINE** near the mouth of Left Testicular vein
- Longer than right
- Opens at right angle in Lt. renal vein
- Crossed by right common iliac artery & Pelvic colon

SECONDARY

VENOUS OBSTRUCTION

How to differentiate from Primary?

INCIDENCE

- Old male >40 years

ETIOLOGY

- **HYPERNEPHROMA**.. " most common "
- Retro-peritoneal tumor, fibrosis

CLINICAL PICTURE

- Course → Rapidly progressive
- **No thrill on cough**
- **NOT reduced** when patient lies down & on elevation of scrotum

Complications of Varicocele:

- ☑ Sub-fertility 20%
→ Thermal theory, Chemical theory
- ☑ Thrombosis → Thrombo-phlebitis
 - C/O : severe pain
 - TTT: RAAA, elevation of scrotum
- ☑ 2ry Hydrocele
- ☑ Testicular atrophy
- ☑ Neurosis



TESTICULAR NEOPLASM

INCIDENCE:

- **MOST COMMON** cancer in **YOUNG MEN** (15-40 years)
- **99% are malignant**
- **RIGHT > LEFT**

(↑Incidence of maldescent)

GERM CELL TUMORS

SEMINOMA
40%

TERATOMA
32%

MIXED
14%

INTERSTITIAL CELL TUMORS

LEYDIG CELL TUMOR
هرقل

SECONDARY TUMORS

- ❑ **LYMPHOMA**
- ❑ **LEUKEMIC INFILTRATION**
- ❑ **METASTASIS INFILTRATION**

SERTOLI CELL TUMOR
تحول الزميل إلى زميلة



GERM CELL TUMORS

	SEMINOMA	TERATOMA
Age :	30-45 years	20-25 واحد زميلنا
Origin :	seminifrous tubules	Toti-potent cells
Risk factors:	- Undescended testis - Testicular desgenesis (klinefelter's \$) - HIV	- Carcinoma in situ - Trauma - Genetics: " <u>ISO-chromosome 12 p</u> " (80% of testicular tumors)
Macroscopic picture :	- Large , firm , smooth - Cut section : <u>Homogenous , Pink</u> - Hemorrhage, necrosis	SHAPE OF TESTIS IS PRESERVED - Cut section : <u>Heterogeneous, yellow</u> - Hemorrhage, necrosis
Microscopic picture :	Sheets of rounded cells with large nuclei , infiltrated with lymphocytes (Good prognostic indicator)	✓ Malignant teratoma intermediate "MOST COMMON TYPE" ✓ Malignant teratoma tropho-blastica "CHORIOCARCINOMA" " MOST MALIGNANT TYPE" ✓ Teratoma differentiated (Dermoid cyst) ✓ Malignant Teratoma anaplastica
Spread :	1- LYMPHATIC SPREAD .. "Most common" - Para-aortic→ thoracic duct→ Virchow LNs - If infiltrated the scrotal skin→ Inguinal LNs 2- LOCAL: spermatic cord, epididymis, scrotal wall 3- BLOOD	BLOOD SPREAD .. "Most common" Lungs are the first site affected
C/O :	Painless swelling with sense of heaviness N.B. Painful in advanced cases, if Hemorrhage occurs	
O/E:	Testis is enlarged, hard, heavy , fixed with Enlarged Para-aortic LNs	
	LOSS OF TESTICULAR SENSATION	GYNECOMASTIA.. in advanced cases

ATYPICAL PRESENTATIONS OF TESTICULAR NEOPLASMA

- ✓ Rapidly accumulating Hydrocele
- ✓ **HURRICANE TYPE ... fatal within 1-2 years**
- ✓ Picture simulating acute Epididymo-orchitis
- ✓ Abdominal mass with Empty scrotal compartment in a patient with undescended testis
- ✓ **OCCULT MANIFESTATIONS:**
 - 1) **SEMINOMA**→ Enlargement of Virchow LNs
 - 2) **TERATOMA**→ Lung metastasis



SEMINOMA		TERATOMA							
Investigations	FOR DIAGNOSIS:								
	☒ Scrotal US → mass, calcification								
	☒ Tumor markers :								
	<table><tr><th>SEMINOMA</th><th>TERATOMA</th></tr><tr><td colspan="2">B-HCG</td></tr><tr><td>LDH</td><td>a- Fetoprotein</td></tr></table>		SEMINOMA	TERATOMA	B-HCG		LDH	a- Fetoprotein	ALPHA FETOPROTEIN • Is raised in Teratoma • May be raised in MIXED tumors • NEVER RISES IN SEMINOMA ALONE
	SEMINOMA	TERATOMA							
B-HCG									
LDH	a- Fetoprotein								
☒ Frozen section biopsy (inguinal approach).. <u>FNABC is # in testicular tumors</u>									
	FOR STAGING								
	▪ Bone scan, CT scan , abdominal U/S , CXR ▪ IVP → distortion of ureteric course (Para-aortic LNs metastasis)								
	FOR FOLLOW UP								
	▪ tumor markers								
	PRE-OPERATIVE								
	▪ LFT, KFT, ECG, Sugar, urine..								
Staging:	▪ I → Testis ▪ II → LNs below diaphragm ▪ III → LNs above diaphragm ▪ IV → Distant metastasis								
Primary treatment :	" HIGH INGUINAL SIMPLE ORCHIECTOMY " (# Radical orchiectomy → Para-aortic LNs)								
Secondary treatment :	"RADIO, CHEMO-SENSITIVE" according to the stage ▪ I → Radiotherapy to Para-aortic LNs ▪ II → As Stage I + Radio-therapy to mediastinum ▪ III , IV → Chemotherapy	" RADIO-RESISTANT " ▪ I → repeated assessment ▪ II , III, IV → As Stage I + Chemotherapy combination ▪ If NO distant metastasis → Retroperitoneal LNs dissection with initial TTT.							

INTERSTITIAL CELL TUMORS

LEYDIG CELL

هرقل

- ☒ Pre-pubertal tumor → Precocious puberty
- ☒ Masculinization of patient
- ☒ Hypertrophy of other testis



SERTOLI CELL

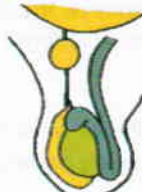
تحول الزميل إلى زميلة

- ☒ Post-Pubertal tumor
- ☒ Feminization of patient
- ☒ Gynecomastia, loss of libido, aspermia



Treatment for both cases: ... ORCHIECTOMY

EPIDIDYMAL CYSTS

	SPERMATOCELE	ENCYSTED HYDROCELE OF CORD	SIMPLE CYSTS OF EPIDIDYMIS
Definition	⊖ DEFINITION: Retention cyst of VASA EFFERENTIA ⊖ Fluid Contains: 1) Living, dead sperms 2) Fluid rich in cholesterol 3) Barly water fluids	⊖ DEFINITION: failure of obliteration of MIDDLE PORTION of processus vaginalis	⊖ DEFINITION: Cyst of vestigial structure "Hydatid of morgagni" ⊖ Contain : 1) Clear fluid 2) NO sperms
Clinical picture	⊖ OLD MALE WITH PAINLESS SCROTAL SWELLING حاسس إن عنده خضية نالقة ⊖ O/E → SWELLING ▪ Painless ▪ Cystic ▪ At upper pole of testis ▪ <u>Not separated from testis by interval</u> 	⊖ C/O → Painless swelling in scrotum ⊖ O/E → Swelling : ▪ Painless ▪ Cystic , translucent ▪ <u>Separated from testis by interval</u> ▪ Mobile across cord → mobility ↓ on down traction of testis "TRACTION TEST" 	⊖ O/E : multiple trans-illumination " CHINESE LANTERN APPEARANCE" 
TTT.	Excision	Excision	Excision if complicated

CHRONIC EPIDIDYMO-ORCHITIS

1) CHRONIC NON-SPECIFIC EPIDIDYMO-ORCHITIS

2) TB EPIDIDYMITIS

⊖ Most common Route → 2ry to Urinary TB **"LYMPHATIC BORNE"** → Usually **UNILATERAL**

⊖ Pathology:

Macroscopic picture: according to route	⊖ LYMPHATIC → Tail is the first site affected, Vas is thickened & beaded ⊖ BOOD → Head is the first site affected, vas is Normal
Microscopic :	⊖ central caseation, Langerhans giant cells, fibrocytes, epithelioid cells

⊖ C/O: symptoms of TB toxemia, urinary TB

⊖ O/E :

☑ Signs of TB toxemia , urinary TB

☑ Epididymis → Enlarged, firm, **Multiple sinuses discharging caseous material POSTERIORLY**

☑ DRE → TB nodules in prostate, seminal vesicles

⊖ Investigations:

1- Urine analysis → Sterile pyuria 2- C&S on Lowenstein media 3- IVU → Detect urinary TB

⊖ TREATMENT:

▪ Sanatorial treatment + Anti-TB drugs

▪ If no response after 2 months → Excision of Vas deferens & Epididymis

3) BILHARZIAL MASS

⊖ Most common Route → Vesico-prostatic plexus of veins

⊖ **VAS IS INTACT, VEINS ARE BEADED**

4) FILARIASIS (ENDEMIC FUNICULITIS)

⊖ **CORD IS THICK AND MATTED , VAS IS MATTED**

UROSURGERY TWEETS!!



▪ WILM's TUMOR:

- One third of patient with wilms tumor present with vague abdominal pain , with minor trauma and hemorrhage with in the tumor
- Neuroblastoma is a childhood supra-renal tumor with bone Secondaries ,enolase +ve VMA in urine and Treated as wilms tumor
- In TTT of wilms tumor: the use of chemo& radiotherapy have improved the overall prognosis to 80% and Early cases are usually cured

▪ Urinary bladder carcinoma is the most common urological malignancy in Egypt

▪ IN BPH there is no relation between the size of the prostate and degree of symptoms ,the severity of symptoms depends on the degree of urethral and bladder neck obstruction

▪ CANCER PROSTATE: there is delayed spread to the rectum due to presence of fascia of dennonvilliers

▪ UROLOGICAL INJURIES:

- Anuria as a complication of renal injury may be due to : shock, reflex inhibition of both kidney ,clot retention, injury solitary kidney

▪ INJURY OF THE URETER

- Most common cause is IATROGENIC (During open surgery especially pelvic surgery)

- Diagnosis :

- UNILATERAL: SILENT ATROPHY OF THE KIDNEY (Most dangerous), Loin pain & swelling
- BILATERAL: Anuria or oliguria

- INVESTIGATION:

- Ascending retrograde urography showing obstruction or extravasation
- CT scan with contrast showing extravasation of the dye

- TTT :

- If immediate diagnosis:

- Fair patient condition: uretero-vesical continuity, Restored by 1st anastomosis
- Poor patient condition: nephrostomy for drainage of urine then delayed repair

- If delayed diagnosis: temporary nephrostomy then delayed repair

▪ URINARY TRACT INFLAMMATIONS: Earliest macroscopic specific appearance of the bilharziasis of the urinary bladder is bilharzial pseudo-tubercle

▪ Sites of impaction of Ureteric stone

- Pelvi-ureteric junction
- At Ureteric orifice,
- At the site of crossing of iliac arteries
- At the site of crossing of the broad ligament in females
- At the site of crossing of the vas in males
- At the site of entry into the bladder wall

▪ 13-90% of small urinary stone <0.5 cm will pass spontaneously

▪ URINARY OBSTRUCTION:

- The most common cause of bilateral hydronephrosis is BPH
- The most common cause of unilateral hydronephrosis is stone

Testicular Tumors

- ⊙ Most common Testicular tumor is **Seminoma**
- ⊙ Most Malignant Testicular tumor is **Choriocarcinoma**
(Earliest testicular tumor metastasizing to LUNGS)
- ⊙ Most common presentation of Testicular neoplasm is a "Painless mass"
- ⊙ Loss of testicular sensation : Seminoma, Syphilis
(Early complete loss of sensation → SEMINOMA)
- ⊙ **METASTATIC TUMORS** of the testis respond to **CISPLATIN**
- ⊙ Tumor markers:
 - Ovarian carcinoma → CA 125
 - Testicular seminoma → B-HCG, alpha fetoprotein
 - Testicular Teratoma → B-HCG, LDH
 - Hepatocellular carcinoma → Alpha fetoprotein
 - Prostatic carcinoma → PSA
 - Colorectal carcinoma → CEA

Congenital anomalies

- ✓ Testicular arrest is associated with urinary anomalies in 15 % of cases
- ✓ Undescended Testis is prone to Torsion, trauma, malignancy
- ✓ Most important diagnostic tool in arrested testis is **LAPAROSCOPY**
- ✓ If testis is not found by Laparoscopy :
 - Testicular agenesis
 - Fetal testicular torsion
 - Maldescended testis
- ✓ Most common site for **arrested** testis is **Inguinal canal** (but superficial inguinal pouch is a very RARE cause)
- ✓ Most common site for **Ectopic testis** (maldescended) is **Superficial inguinal pouch**
- ✓ Ectopic testis is due to rupture of scrotal tail of gubernaculum "**Lockwood theory**"
- ✓ Best treatment for Retractable testis is Re-assurance
- ✓ **CRYPTORCHIDISM**:
 - Occurs in 5% of new bon babies
 - Laparoscopy is the best diagnostic method
 - ↑ Risk of malignancy
 - Associated with ↓ Fertility



Fournier Gangrene

- ✓ May follow minor injuries to Perineum
- ✓ Sudden onset of scrotal inflammation + sudden onset of gangrene (obliterative arteritis)
- ✓ Caused by mixed infection "**SYNERGISM**" **HEMOLYTIC STREPT.** + Staph + Ecoli ..etc
- ✓ May be associated with Necrotizing Fasciitis → anterior abdominal wall
→ **MELONY GANGRENE**
- ✓ Treatment → Antibiotics & wide excision + skin graft

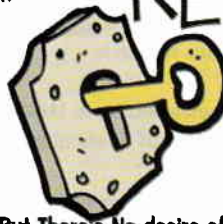
Hydrocele, Varicocele

- ✓ Most important diagnostic feature of Encysted hydrocele of Cord is "**Positive traction test**"
- ✓ **SECONDARY HYDROCELE** may be due to:
 - 1) Testicular tumors
 - 2) Testicular Torsion
 - 3) Epididymo-orchitis
 - 4) Following Herniorrhaphy
- ✓ Fluid :
 - a) Crystal clear → Epididymal cyst
 - b) Barly Watery fluid → spermatocoele
- ✓ **HEMATOCELE**:
 - Tapping of hydrocele is the most common cause of hematocele
 - Old clotted hematocele may simulate testicular tumor

MISCELLANEOUS:

- ✓ **TB** of cord → **Vas is beaded**
- ✓ **Bilharziasis** of Cord → **Veins are beaded**

KEYS TO.. Cases!!



1. Patient 40 years old presents with dull aching pain in flanks and irregular upper quadrant abdominal mass with mild impairment of renal function. US show multiple cysts in both kidneys.

Congenital polycystic kidney.

2. Patient presents with loin pain, swelling and fever Usually after pelvic surgery,

Ureter injury.

3. A polytraumatic patient presents with supra-pubic pain, He was in agony to Micturate before the trauma, But There's No desire after the trauma x-ray shows ground glass appearance and US shows free fluid in peritoneum.

Intra-peritoneal rupture urinary bladder.

4. A polytraumatic patient presents with supra-pubic pain and urine retention with desire to micturate. X-ray shows fracture pelvis.

Extra-peritoneal rupture bladder.

5. Patient with history of trauma to perineum presents with, Few drops of blood at tip of Penis, perineal hematoma and urine retention with desire to micturate.

Extra pelvic rupture urethra.

6. Adult patient presents presents with right loin pain increases by movement, respiration and coughing & hectic fever. Plain X-ray shows scoliosis with obliteration of psoas shadow elevation & fixation of the diaphragm. Urine analysis is sterile.

Peri-nephric abscess.

7. Adult pt. with Hx of renal stones, C/P: Anemia, fever & large renal swelling. Urine analysis shows pyuria.

Open type pyonephrosis.

8. Middle aged usually male presents with hematuria, markedly increased pain & frequency. Cystoscope shows sandy patches or other specific lesion. Bilharzial antibody detection by ELISA is positive.

Bilharziasis of UB.

9. Middle aged male presents with dull aching pain in flanks associated with nausea and vomiting. US shows radiolucent or radio-opaque shadow.

Renal colic

10. Patient presents with severe agonizing pain in loin radiating to groin of sudden onset short duration associated with nausea and vomiting. On examination rigidity of the lateral abdominal muscles.

Ureteric colic (stone).

11. Patient with history of stones or BPH presents with mild pain in loin increases by excessive fluid intake with dragging heaviness in loin. IVU shows patient has a renal mass in the Loin

Hydronephrosis.

12. Male above 50 years old presents with painless, recurrent, profuse, total hematuria. May be pain or renal mass or other non-specific symptoms, polycythemia. IVU shows distorted pelvi-clayceal system

Renal cell carcinoma (Hypernephroma.) (Grawitz tumor.)

13. Old patient with history of chronic irritation to UB or Bilharzial precancerous lesion presents with exacerbation of symptoms of cystitis. (Painless terminal hematuria, necroturia, frequency and dysuria). IVU shows irregular filling defect or just irregularity in the bladder wall.

Cancer urinary bladder (TCC or SCC according to predisposing factor).

14. Male above 50 years old presents with frequency of micturition, Difficulty to start, to maintain and to finish, ↑libido and urine retention. DRE shows that prostate is soft, smooth, symmetrical, preserved median sulcus, notch between it and seminal vesicles is preserved & mobile mucosa of rectum over it.

Benign Prostatic hyperplasia

15. Black old male patient presents with symptoms of difficult to start, to maintain or to finish micturition. DRE shows that the prostate is hard, asymmetrical, With Backache

Cancer prostate.

TESTIS



UNDESCENDED TESTIS

Infant presented with an empty poor developed scrotum with or without associated renal anomalies.

RETRACTILE TESTIS

Baby with an empty well developed scrotum, normal testis, O/E there's Exaggerated cremasteric reflex

TESTICULAR TORSION

Infant or young adult with sudden severe testicular pain, absent cremasteric reflex, duplex shows obstruction of testicular vessels & urine analysis is free

SECONDARY VAGINAL HYDROCELE

Middle aged male with rapidly accumulating hydrocele & Pregnancy test is POSITIVE

PRIMARY VARICOCELE

Middle aged male with signs of congenital mesenchymal weakness with or without dragging pain in testis which disappears on lying down & elevation of testis.

SEMINOMA

Middle aged male with Abdominal Mass, Painless swelling In testis & loss of testicular sensation.



TESTIS QUESTIONS



- Hydronephrosis : Etiology , C/P, Investigations& TTT
(Ain shams: 2000 - Ain shams: 2009 - Azhar F: 2004 - Azhar M: 2000)
- Discuss Unilateral OR bilateral Hydronephrosis
(Azhar M: 2011)
- Hypernephroma " Renal cell carcinoma ": Diagnosis & TTT
(Ain shams: 2002,2005,2009- Kasr: 2003 - Ain shams: 2002,2005,2009)
- Management of renal tumors
(Azhar F: 2007)
- Acute retention of urine
(Ain shams: 2003,2005 - Azhar M: 2007, 2004,2003)
- Management of obstructive retention
(Ain shams: 2003)
- Causes and management of retention
(Azhar F: 2007)
- Rupture Kidney: C/P , ttt and follow up
(Ain shams: 2004)
- Urethral injury
(Kasr: 2011)
- Types of renal calculi , TTT of Kidney stones, TTT of lower end ureter stones
(Ain shams: 2011- Kasr: 2007 - Azhar F: 2001 - Kasr: 2003 - Azhar F: 2009)
- Calcular anuria
(Kasr: 2011)
- Give explanation for the following : Why bilateral orchidectomy may be indicated for ttt of advanced prostatic cancer
(Kasr: 2003)
- BPH : C/P complications, indications for surgery
(Kasr: 2003 - Azhar F: 2009 - Kasr: 2003 - Azhar M: 2001- Kasr: 2003)
- Ectopia vesica: C/P, Radiological finding , complications
(Kasr: 2009)
- Give an account on testicular tumor
(Kasr: 2011)
- Torsion of the testis : C/P , DD and investigations
(Azhar F: 2010)





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SURGI- TOONS

NEURO SURGERY



Michael Safwat
M.B.B.Ch. - Ain Shams University

HEAD INJURIES

INTRA- CRANIAL

- EXTRADURAL
- SUBDURAL
- SUBARACHINOID

SKULL INJURIES

- VAULT
- BASE

SCALP INJURIES



SKULL INJURY

VAULT FRACTURE

FISSURE FRACTURE

DEPRESSED FRACTURE

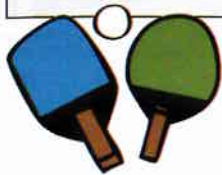
SIMPLE
(CLOSED)

COMPOUND
(OPEN)



POND FRACTURE (PING PONG FRACTURE)

- Simple depressed fracture in children
- Bone is INDENTED rather than Fractured
- Dura is INTACT
- Corrects itself with growth of skull



BASE FRACTURE

ETIOLOGY

- Trauma to Vault مصارعة
- Trauma to chin بوكس
- Trauma to spine وقع من البلونة

ANTERIOR CRANIAL FOSSA

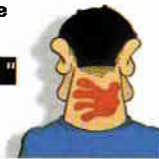
- ♣ Epistaxis, Subconjunctival hemorrhage
"PANDA SIGN" = "RACCOON EYE"
DD = black eye of sub-conj. hge
- ♣ Escape of CSF from Nose
- ♣ Injury of I, III, IV, Ophthalmic branch of V Nerve



MIDDLE CRANIAL FOSSA

POSTERIOR CRANIAL FOSSA

- ♣ Mastoid Pr. Discoloration "BATTLE'S SIGN"
Scalp emphysema around the ear.
- ♣ Escape of CSF from Ear
- ♣ Injury of Mandibular, maxillary br. Of V, VI, VII, VIII Nerve
- ♣ Swelling at Nape of Neck
- ♣ "SUB-OCCIPITAL HEMATOMA & STIFFNESS"
- ♣ CSF escape from Mouth
- ♣ Injury of IX, X, XI Nerve



COMPLICATIONS

As any head injury (see Later)

TTT OF POLYTRAUMATIZED PATIENT

- ☞ Rest in Bed
 - Rhinorrhea → Semi-sitting & avoid blowing, Surgery (If failure after 10 days)
 - Otorrhea → lie on opposite side & Clean dry dressing
- ☞ Antibiotics, TTT of associated brain injury

Vault Fracture

FISSURE FRACTURE

ETIOLOGY:

Blunt trauma by a wide surface area (Wall)

SITE:

Starts at site of impact & Runs away from it

COMPLICATIONS: ... LESS THAN DEPRESSED FRACTURES

- Hematoma, Bleeding
- Infection, Intracranial Hemorrhage
- CSF leakage, Epilepsy

TREATMENT:

- 1- First aid (ABCD)
- 2- Primary survey
- 3- Secondary survey
- 4- At hospital:
 - CONSERVATIVE: Like subdural Hemorrhage
 - TTT. of associated lesions if present



DEPRESSED FRACTURE

SIMPLE (CLOSED)

COMPOUND (OPEN)

	SIMPLE (CLOSED)	COMPOUND (OPEN)
Etiology	Blunt round object	Localized sharp object or severe blunt object
Age	Infants or children	Adults (Stronger skull)
Complication	:: LESS COMMON :: Overlying hematoma	:: MORE COMMON :: ▪ Scalp: Profuse bleeding ▪ Dura: CSF leakage, Brain herniation, infection ▪ Contusion & epilepsy ▪ Intra-cranial hemorrhage
Treatment	✕ CONSERVATIVE TTT. ✕ SURGICAL TTT if indicated: - Large depressed segment > 1inch - Depression over motor area, or speech center - Associated brain damage or Dural tear - If causing cosmetic deformity - If overlying air sinus	✕ SURGICAL TTT. - Removal of Foreign bodies - Gentle elevation of depressed fracture, Sucking of any necrotic tissue & Hemostasis is done - Repair of Dural tear

EXTRA-DURAL HEMORRHAGE

DEFINITION: Hemorrhage between skull, dura matter.
Most commonly in Temporal & Parietal regions

CAUSES (3)

- 1) Fractural Temporal bone
- 2) Fracture Parietal bone
- 3) Without fracture in Children

SOURCE OF BLEEDING (3)

- 1) Common → Anterior branch of MMA
- 2) Serious → Venous sinus
- 3) Insignificant → Diploic Veins

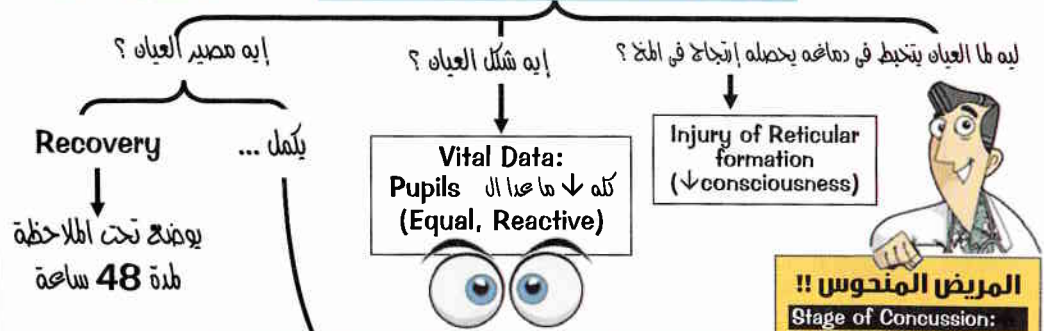
DIRECTION OF BLEEDING (3)

- 1) Upwards → over precentral motor cortex
- 2) Outwards → hematoma deep to temporalis
- 3) Downwards → Middle cranial fossa

STAGES (3)

- 1) Stage of CONCUSSION
- 2) Stage of LUCID INTERVAL
- 3) Stage of COMPRESSION

STAGE OF CONCUSSION



STAGE OF LUCID INTERVAL

Recovered from Coma
(If Middle Meningeal artery injury)

N.B. if blood sinus is affected
→ NO Lucid interval

يكمل ...

المريض المنحوس !!

Stage of Concussion:

NO Bleeding (Vessel recoil) + ↓ BP

Stage of Lucid interval:

↑ BP, overcoming Recoil, leading to bleeding

Stage of Compression:

↑ ICT, Localization, Terminal compression

STAGE OF COMPRESSION

STAGE OF ↑ ICT

- ↓ Consciousness
- Headache, Nausea, Vomiting
- Irritability or Depression
- CUSHING TRIAD: ↑ BP, Bradycardia, Irregular respiration

LOCALIZATION

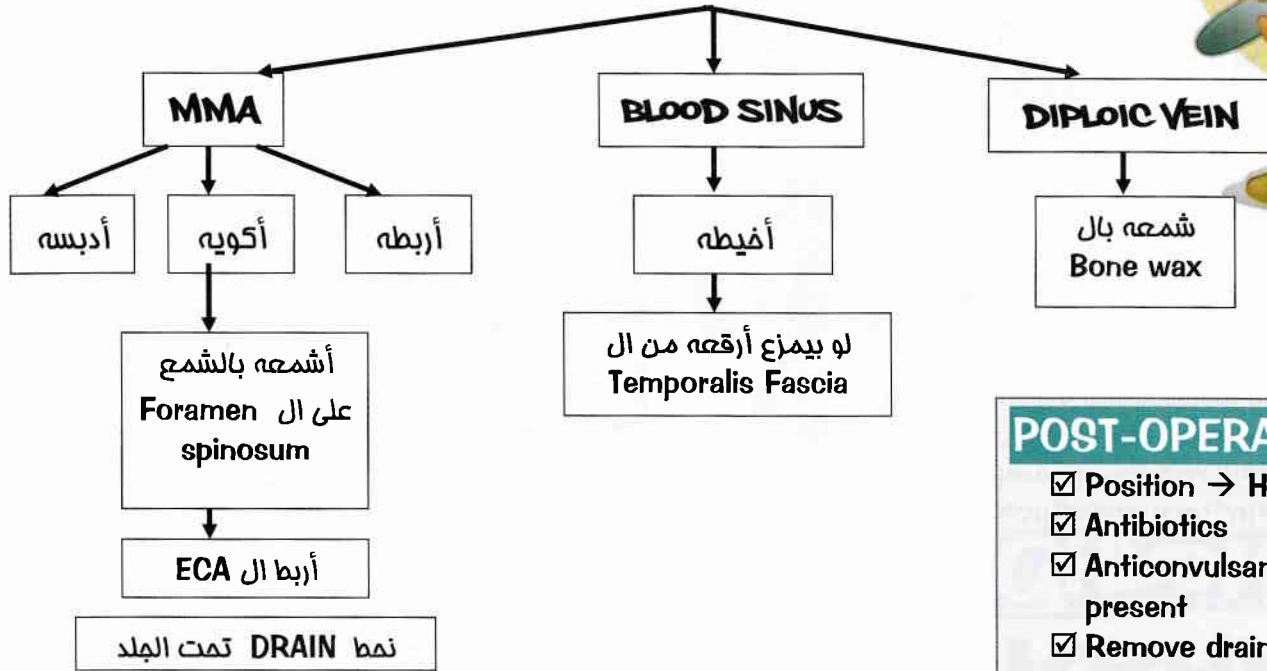
- MOTOR (CONTRALATERAL Convulsions, Hemiplegia)
- OCCULOMOTOR (IPSILATERAL pupillary constriction, Dilated fixed pupil)

TERMINAL COMPRESSION

- COMA
- Hyperpyrexia, Rigidity, Bilateral dilated fixed pupils

SURGICAL TTT:

- نحلق له ظليطة
- نفتح فتحة شكلها " ؟ "
- تلاقى ال Temporalis muscle و نشقها
- هنلاقي العظم ... نعمل Osteoplastic Flap
- هلاقى دم ... شيله بالشفاطة و ال Saline
- لما أشيل الدم ... هلاقى إيه متور؟؟؟



POST-OPERATIVE CARE

- ✓ Position → Head elevation
- ✓ Antibiotics
- ✓ Anticonvulsants if PDF is present
- ✓ Remove drain after 24 hrs
- ✓ Remove stitches after 7 days

SUB-DURAL HEMORRHAGE

ACUTE

- Due to rupture of **LARGE CORTICAL VEIN**
(As it crosses the subdural space)
- Bilateral & Severe
- Persistent loss of consciousness
(**NO LUCID INTERVAL**)
- CT : **CRESENTIC** (concavo-convex)
زى هلال رمضان..
- Mortality up to **50 %**
- Treatment : (As Extradural Hemorrhage)
Intraoperative, the Dura is:
 - Bluish
 - Tense
 - Non-pulsating



CHRONIC

حكاية جدو الخمورجى الى مخه صغير من الخمرة
Atherosclerosis و كمان عنده Elderly alcoholic

وحفيده راح رج دماغه وقاله " جدو .. يا جدو "

Sudden displacement of brain within skull
→ rupture of superficial cerebral veins

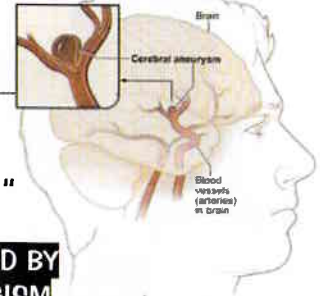
بعد 3 اسابيع - 3 شهور جاله صداع

و زغللة و دوخة و نسيان

Vague symptoms

(Headache, blurred vision, projectile vomiting, personality changes, mental apathy, stupor)

TTT: Evacuation Burrholes



SUB-ARACHINOID HEMORRHAGE

- ETIOLOGY:
 - Most common cause is **TRAUMATIC**
 - 2nd most common is Rupture " Berry's aneurysm "
- CLINICAL PICTURE:
 - SUDDEN ONSET OF SEVERE HEADACHE FOLLOWED BY LOSS OF CONSCIOUSNESS + SIGNS OF MENINGISM**
- INVESTIGATION OF CHOICE: **CT-SCAN**
- TREATMENT: Endovascular Coiling + Evacuation of hematoma

PERIPHERAL NERVE INJURY



PERIPHERAL N. INJURY

TYPES

NEUROPRAXIA

- Complete motor loss
- PARTIAL** sensory loss
- NO** degeneration
- Spontaneous recovery within 4-6 weeks

AXONTEMESIS

- Complete motor loss
- COMPLETE** sensory loss
- Degeneration followed by **REGENERATION** (1mm/day)

NEUROTOMESIS

- Complete motor loss
- COMPLETE** sensory loss
- Degeneration **ONLY**
- Recovery after surgical repair **ONLY**
- Best prognosis with **PURELY MOTOR** injuries

CLINICAL PICTURE

MOTOR

Loss of

Voluntary Movement

Reflex (Superficial & Deep)

Ms. bulk

SENSORY

Loss of

Superficial sensation

Deep sensation

Rest = Casualgia

Due to partial injury of MEDIAN, SCIATIC N.

AUTONOMIC

Vasomotor

Pseudo-Motor

Trophic Changes

Anhydrosis

+ PALPABLE NEUROMA

(**SURE SIGN OF NEURONTOMESIS**)

May be detected along the course of the affected nerve

+ TINEL'S SIGN

(FOR FOLLOW UP)

Light percussion on course of nerve from below upwards → Tingling

INVESTIGATIONS

NCV

Normal: 50-70 m/sec

No abnormality detected in Neuropraxia

EMG

Fasciculations after 2-4 weeks

SWEATING TEST

QUINIZARIAN POWDER

Anhydrosis → No coloration

TREATMENT

CONSERVATIVE

In Closed injuries

SURGICAL

In Open injuries

ORTHOPEDICS

If there's Failure of nerve repair

TREATMENT OF PERIPHERAL NERVE INJURY

CONSERVATIVE

✓ Closed injuries:

- Neuropraxia
- Axontemesis



- ✓ Splintage
- ✓ Exercise & Massage
- ✓ Electrotherapy
- ✓ Protection of Skin

SURGICAL

- ✓ Neurontemesis
- ✓ Open injury or Closed with failure of recovery
- ✓ Palpable Neuroma, Tinnel's sign



ORTHOPEDIC

- ✓ Improve function if Recovery is impossible



- ✓ Arthrodesis
- ✓ Tendon transplant
- ✓ Amputation if severe Ulceration & infection

PRIMARY SUTURE

- ✓ IMMEDIATE SUTURE
- ✓ Indication: Injuries during operations
- ✓ Disadvantages: Thin Nerve sheath

SECONDARY SUTURE

(3-4 weeks after injury)



At Time of Wound repair:

Approximate 2 ends of Nerve by black silk suture

3-4 weeks later:

- ✓ 2 ends are cut & Exposed & Trimmed
- ✓ Apposition of Nerve sheath
- ✓ Repair (Epi-neural, Interfascicular)

IF GAP IS PRESENT ...

- ✓ Neurolysis
- ✓ Division of Un-important branches
- ✓ Transposition of Nerves
- ✓ Nerve grafting
(Sural N. → Cable graft)
- ✓ Fixation in Plastic Cast for 3 weeks

SIGNS OF PERIPHERAL N. INJURIES

MEDIAN N. INJURY

AT WRIST:

- ✓ Thenar muscles :
 - Opponens Pollicis → Ape Hand (Tested by counting finger test)
 - Flexor pollicis brevis → Partial loss of Flexion of Thumb (Tested by pen touch test)
 - Abductor Pollicis brevis
- ✓ 2 Lateral lumbricals

AT ELBOW:

- ✓ Flexor carpi radialis → Weak flexion of wrist & Ulnar deviation
- ✓ Lateral ½ of Flexor digitorum profundus → +VE OCHSNER'S CLASPING TEST (ORIENTAL PRAYER POSITION)
- ✓ Pronator teres → Loss of pronation
- ✓ Flexor pollicis longus → Complete Loss of Flexion of Thumb (Tested by Pen touch test)

SENSORY LOSS :

- ✓ Lateral 2/3 of palmar surface
- ✓ Lateral 3 & ½ fingers
- ✓ Dorsum of terminal phalanges



COUNTING FINGER TEST



PARTIAL CLAW HAND



FROMENT TEST



ORIENTAL PRAYER POSITION

ULNAR N. INJURY

AT WRIST:

- ✓ Hypothenar Ms → WASTING (Loss of abduction of little finger)
- ✓ Interossei → Guttering, No fanning, no abduction (Tested by Card Test)
- ✓ 2 Medial Lumbricals → Partial Claw hand (Extension of MPJ + Flexion of IPJ)
- ✓ Adductor pollicis → Grasp Paper by FLEXORS instead of Adductors (+VE FROMENT'S TEST)

AT ELBOW:

- ✓ Flexor carpi Ulnaris → Weak flexion of wrist & Loss of Normal Ulnar deviation
- ✓ Lateral ½ of Flexor digitorum profundus → Ulnar paradox (Extension of Terminal phalynx of medial 2 fingers)

SENSORY LOSS :

- ✓ AT WRIST:
 - Medial 1/3 of palmar surfa
 - Medial 1 & 1/2 fingers
 - DORSAL SURFACE IS SPARED
- ✓ AT ELBOW:
 - DORSAL & PALMAR Surfaces are affected

RADIAL N. INJURY

كوكو واو + 3 HOWEVER + كل ما نزل محطة تنغد واحدة LONGUS + COIN

Sensory Loss



لو جرحته في ال Spiral Groove

Long head of triceps تنغد

فيكون الشكل WRIST drop + finger drop

و جرح ال Elbow لو في ال

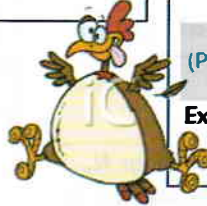
Posterior Interosseous N.

تنغد Extensor carpi radialis LONGUS

فيكون الشكل ONLY FINGER drop



SATURDAY NIGHT'S PALSY



FLEXION OF THE ELBOW
(ال Triceps باظت)

HOWEVER ... ممكن يعمل Extension

← of Elbow لما يميل لقدام

PRONATION

(Loss of Supinators)

HOWEVER ... ممكن يعمل Supination

← إقفش على ال Biceps

WRIST DROP

(Paralysis of extensors of the wrist)

+ **FINGER DROP**

HOWEVER ... ممكن يعمل Extension

← Wrist إسند ال Fingers



Radial N.
Injury At
Elbow



Radial N.
Injury At
Spiral
Groove



Radial N.
Injury At
Axilla



الكريزة

- **ETIOLOGY:** Fracture, dislocation, Pressure, injection
- **CLINICAL PICTURE:**
 - AXILLA → Flexed elbow, Wrist Drop, Finger drop
 - SPIRAL GROOVE → Wrist Drop, Finger Drop
 - POST. INTEROSSEOUS N. → Finger Drop
- **INVESTIGATIONS:**see before...
- **TREATMENT:** ...See before + COCK UP SPLINT

CARPAL TUNNEL SYNDROME

DEFINITION: Compression of the median N. inside the carpal tunnel under the Flexor Retinaculum

ATTACHMENT

- ✓ Medial → Pisiform, hamate
- ✓ Lateral → Scaphoid, Trapezium

RELATIONS

SUPERFICIAL

2 Ulnar + 2 Palmar

- ✓ Ulnar N.
- ✓ Ulnar vessels
- ✓ Palmar cutaneous Br. Of Ulnar N.
- ✓ Palmar cutaneous Br. Of Median N.
- ✓ Tendon of Palmaris longus

DEEP

كل الباقي
Including
Median N.



ETIOLOGY



- ✓ Primary: Idiopathic
- ✓ Secondary to
 - Myxedema
 - Rheumatoid arthritis
 - Colle's fr.
 - Scaphoid Fr.

TYPES

- ✓ Acute
- ✓ chronic

CLINICAL PICTURE:

SYMPTOMS:

- EARLY (pain on the hand along the hand & Lateral 3 fingers)
- LATE (Weakness, Parasthesia, Numbness)

SIGNS: As Median N. injury at wrist but.. **NO SENSORY LOSS AT PALM**
(Palmar cutaneous br. Of median N. passes superficial)

INVESTIGATIONS

- ✓ NCV (Nerve conduction Velocity)
- ✓ EMG (Electromyography)

TREATMENT

- ✓ Division of Flexor retinaculum
- ✓ Multi-vitamins

SCIATIC NERVE INJURY

MOTOR

Paralysis of hamstrings
WEAK FLEXION OF KNEE

Paralysis of All Leg Ms
FOOT DROP

SENSORY

ANESTHESIA BELOW KNEE

Except:
MEDIAL SIDE ..
of leg, foot, toes
Supplied by
SAPHENOUS N.

OTHERS

- Autonomic
- Palpable Neuroma
- Tinel's sign

الكريزة

- **ETIOLOGY:** Post. Hip dislocation, IM injection
- **CLINICAL PICTURE:** Drop foot, clawing of toes, anesthesia below knee except medial side
- **INVESTIGATIONS, TTT:**
... As Scheme ...



SCIATIC NERVE

LATERAL POPLITEAL NERVE INJURY

Injury is common at it superficial part
→ **FRACTURE NECK OF FIBULA**

MOTOR

Paralysis of Dorsiflexors

FOOT DROP



Paralysis of Foot Evertors
PARALYTIC TALIPUS EQUINO-VARUS

SENSORY

ANESTHESIA OVER LATERAL
side of leg & part
of dorsum of foot



OTHERS

- Autonomic
- Palpable Neuroma
- Tinel's sign

MEDIAL POPLITEAL NERVE INJURY

Paralysis of Plantar-flexors & Ms. of Toes

CLAWING OF TOES

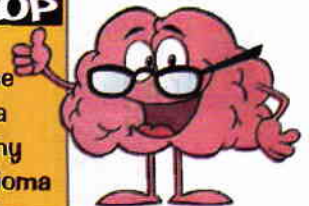
DORSIFLEXION CALCaneo-VALGUS



ANESTHESIA OVER SOLE

DD FOOT DROP

- Sciatic N. injury
- Lumbar disc prolapse
- Fracture Neck Fibula
- Peripheral neuropathy
- Parasagittal Meningioma



BRACHIAL PLEXUS INJURY

COMPLETE (ALL ROOTS)

MOTOR:

All Ms. of UL
EXCEPT TRAPEZIUS

SENSORY

Anesthesia of Whole UL except :

- ✓ Medial side of arm (T2)
- ✓ Skin over Upper part of Deltoid (C4)

+HORNER'S SYNDROME

UPPER TRUNK (ERB'S DUCHENNE PARALYSIS) (C5-C6)

POLICEMAN TIP DEFORMITY

(Waiter's Tip position)

Anesthesia
over **DELTOID ms.**

+NO HORNER'S \$



LOWER TRUNK (KLUMPKE'S PARALYSIS) (C8-T1)

Complete
Claw hand



Along Medial aspect of Forearm
& Medial 3&1/2 fingers

+HORNER'S SYNDROME

Ptosis,
Myosis,
Anhydrosis,
Enophthalmus

- ### ETIOLOGY
- ✓ Open injuries
→ Gunshots, stabs
 - ✓ Traction Injuries
e.g. : Birth injuries
 - ✓ Pressure Injuries:
✓ Fracture clavicle
✓ Dislocation of shoulder



AXILLARY N INJURY

ETIOLOGY

- ✓ **FRACTURE SURGICAL
NECK OF HUMERUS**
- ✓ Shoulder dislocation
- ✓ Direct blow to shoulder



MOTOR:

DELTOID MUSCLE

- ✓ **FLAT SHOULDER**
- ✓ Failure of abduction From 15°- 90°

CLINICAL PICTURE

SENSORY

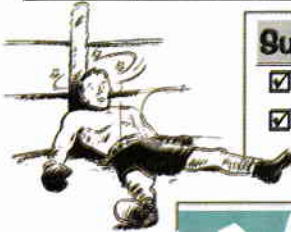
Skin of Lower part of deltoid

BADGE AREA



GLASGOW COMA SCALE : "GCS"

	EYE بيفتح عينيه؟		VERBAL أصوات و كلمات		MOTOR حركات	
	1	2	3	4	5	6
Eyes	- ve	in response to painful Stimuli	In response to Voice	Spontaneously		
Verbal	- ve	Incomprehensible Sounds	Uttering	Confused	Oriented, Normal	
Motor	- ve	Extension to painful stimulus عكس الطبيعي De-cerebrate	Flexion to painful stimulus عكس الطبيعي De-corticate	Flexion + Withdrawal الطبيعي	Localize painful stimulus	Obey commands



Summation of 3 values & Interpretation:

- ☑ GCS 3 → Deep Coma & death بوجدك
- ☑ GCS <9 → Severe, Endotracheal intubation is a must

MYOTOMES

- C5 → Deltoid (shoulder movement, raise arm)
- C6 → Biceps (Flexion of Elbow)
- C7 → Triceps (extends Elbow, wrist)
- C8 → Wrist, small muscles Of hand
- L4 → Quadriceps femoris (Extension of leg at knees)

HEMATOMA

SUBCUTANEOUS

Localized cystic swelling in the SC tissue



SUBAPONEUROTIC

- Diffuse hematoma (BLACK EYE)
- DD: Subgaleal Collections

CEPHALHEMATOMA

- Hematoma limited to suture line
- DD: Depressed skull fracture



Cut wound in Scalp causes SEVERE BLEEDING
(Scalp is very vascular & ↑↑ fibrous tissues prevent recoil)

N.B.

TUMORS

SKULL TUMORS

BENIGN

- Ivory osteoma (Frontal sinus)

MALIGNANT

- PRIMARY:
 - Osteosarcoma
 - Fibrosarcoma
 - Multiple Myeloma
 - Giant cell tumor
- SECONDARY:
 - Breast, Thyroid, Adrenal, Kidney, Prostate

SCALP TUMORS

BENIGN:

- Lipoma
- Papilloma
- Plexiform Neurofibroma
- Hemangioma
- Cirroid Aneurysm

LOCALLY MALIGNANT:

- Basal cell carcinoma

MALIGNANT:

- Epithelioma
- Melanoma
- Fibrosarcoma
- Sebaceous Adenocarcinoma
- Metastasis

BRAIN TUMORS

GLIAL TISSUES:

- Astrocytoma
- Oligodendroglioma
- Glioblastoma
- Epindymoma

MENINGES:

- Meningioma
- Meningiosarcoma

NERVES:

- Neuroma (e.g. Acoustic Neuroma)

EMBRYONIC

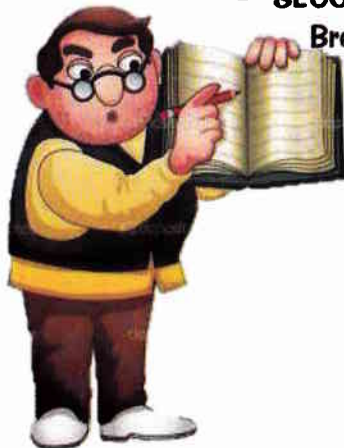
- Medulloblastoma

ANTERIOR PITUITARY

- Pituitary adenoma

MALDEVELOPMENT

- Craniopharyngioma



BRAIN TUMORS

INCIDENCE:

**MOST COMMON
BRAIN TUMORS ARE
SECONDARIES (50%)**

ETIOLOGY: UNKNOWN

- Exposure to radiation
- Genetic (Lu Frimani \$, Neurofibromatosis, Turcot's \$)
- Hormone replacement therapy
- Head injuries

CLINICAL PICTURE

↑ INTRACRANIAL TENSION

- HEADACHE:
(Dull aching, Peak at morning,
↑ by cough, Straining)
- VOMITING:
(Projectile, ↑ In morning, Not related to
Meals, Not Preceded by Nausea)
- PAPILEDEMA
- FALSE LOCALIZING SIGNS:
 - Ventricular dilatation
 - Cranial N. Paralysis (VI)
 - Herniation \$

TRUE LOCALIZING SIGNS

- CEREBRAL HEMISPHERES
Frontal, Parietal, Temporal, Occipital
- CEREBELLO-PONTINE ANGLE TUMORS
 - Ipsilateral cerebellar ataxia
 - Ipsilateral Affection of 5th, 7th, 8th N.
 - Contralateral Hemiparesis
- PITUITARY TUMORS:
 - HORMONAL MANIFESTATIONS
 - Neurological manifestations, ↑ ICT
 - Bi-temporal Hemi-anopia

INVESTIGATIONS

- MRI... **INVESTIGATION OF CHOICE**
- CT Scan
- Plain X-ray: **SIGNS OF ↑ ICT**
(Separation of cranial sutures, Beaten Silver appearance, Enlargement
of Sella turcica, Rarefaction & destruction of the dorsum sellae &
posterior clinoids, Encroachment on the sphenoid air sinus)
- Cerebral angiography

TREATMENT:

- RADICAL SURGERY :
 - For BENIGN SUPERFICIAL TUMORS
 - Patients with signs of compression (After urgent Preoperative dehydration)
 - Patients with hydrocephalus
- PALIATIVE TREATMENT:
(dehydrating measures, debulking, chemotherapy, radiotherapy, symptomatic treatment)
 - Deep Tumors, Malignant infiltrative tumors, Residual, Recurrent tumors



- Most common Brain tumor are SECONDARIES
- Most common Primary Brain tumor → GLIOMA
- 2nd Most common Primary Brain tumor → MENINGIOMA

الكريزة

FRACTURE SPINE

**MOST COMMON AFFECTED SPINES AFFECTED ARE
CERVICAL & DORSOLUMBAR REGION**

ETIOLOGY

- Major trauma on top of normal spine
E.X. → Compression Fr., Burst Fr., Whiplash injury
- Minor trauma on top of diseased spine (PATHOLOGICAL FRACTURE)
Metabolic (OSTEOPOROSIS), Destructive (POTT'S DIS)



CLINICAL PICTURE

- History of trauma, Pain, Swelling, Disturbance of function
- O/E: Palpation of spine shows a **GAP BETWEEN THE SPINES**
- CENTRAL CORD SYNDROME:** Ischemia of spinal cord due to hyperflexion, hyperextension of the neck in an injured patient
- BROWN SEQUARD SYNDROME:** Ipsilateral Motor loss + Contralateral Sensory loss

COMPLICATIONS

- SPINAL SHOCK**
 - Loss of vascular tone, bradycardia
 - Loss of muscular tone → Hypovolemia & Hge

INVESTIGATIONS

- DIAGNOSIS → Plain x-ray spine, AP, lateral, odontoid
- COMPLICATIONS → CT, MRI

TREATMENT

- ABCD+ Fixation of spine
- Primary survey (....), secondary survey (...)
- Definitive treatment :
 - If stable → External fixation (e.x. Plastic collar, shoulder spica)
 - If Unstable → Decompression, internal fixation

BRAIN ABSCESS

**MOST IMPORTANT RESPONSE THAT LIMITS SPREAD OF INFECTION
→ FORMATION OF COLLAGEN CAPSULE IN DEVELOPING ABSCESS**

ETIOLOGY

- ORGANISM → Gram +ve, Gram -ve, anaerobic ...etc
- ROUTE → Direct spread, blood spread
- PDF → Immunocompromized patient, septic focus, post-traumatic

CLINICAL PICTURE 3 كلمات

- INFECTION FAHM, Tachycardia
- MASS ↑ICP
- IN BRAIN Irritation, destruction

**# LUMBAR
PUNCTURE**

INVESTIGATIONS

- LABORATORY ↑WBC, ↑ESR
- RADIOLOGICAL **MRI (INVESTIGATION OF CHOICE)** → Hyperintensity

TREATMENT

MEDICAL EMERGENCY

- Hospitalization, life support → Surgical drainage (Aspiration, excision)
- If small abscess (<2cm) → Medical TTT

SPINA BIFIDA

SPINAL DYSRAPHISM

DEFINITION: Failure of Fetus spine to close properly
during 1st month of Pregnancy

SPINA BIFIDA OVERTA

MENINGEOCELE

- Bulging of meninges through spinal defects
- NO nervous tissue
- SWELLING:
 - site → Lumbo-sacral, back of neck
 - Consistency → Cystic
 - Translucent
 - Compressible
 - Expansile impulse on cough
- TTT → Repair during first few months of life

MENINGEO- MYELOCELE

- **MOST COMMON TYPE**
- Protrusion of spinal cord through spinal defects
- Dilated UB, patulous anus
- Associated anomalies → Hydrocephalus, Arnold chiari
- TRANS_ILLUMINATION TEST → Dark
- TTT → REPAIR AS SOON AS POSSIBLE WITHIN 24-48 HOURS

MYELOCELE

- Incompatible with life

SYRINGOMYELOCELE

- Dilation of central canal

SPINA BIFIDA OCCULTA

- Mostly Asymptomatic till puberty
(Some cases Present with Urinary incontinence)
- TTT → NOT REQUIRED
If there's Neurological affection → Cutting The MEMBRANA-REUNIENS
(Fibrous band connecting skin to meninges)



RISK FACTORS

- Folic acid deficiency
- Positive family history
- Having a baby with Neural tube defects
- Poorly controlled DM
- Anticonvulsants

INVESTIGATIONS FOR DIAGNOSIS

- **PRE-NATAL:**
Maternal serum Alpha-fetoprotein at 2nd trimester
- **POST-NATAL:**
 - 1) If mild → X-ray
 - 2) If severe → MRI, CT scan
 - 3) If associated hydrocele → CT scan, X-ray



DISC PROLAPSE

DEFINITION: Rupture of annulus fibrosis+ herniation of nucleus pulposus

80% LUMBAR
(L₄, L₅ - L₅, S₁)

TYPES

- LATERAL → Unilateral
- CENTRAL → Bilateral

MOTOR

- LMNL → Weakness, paralysis in Lower limbs

SENSORY

- Radicular pain , referred to lower limbs
- Hypothesia
- Loss of superficial, deep sensations

AUTONOMIC

- Sphincteric disturbances
- Vasomotor changes

20% CERVICAL
(C₅, C₆ - C₆, C₇)

TYPES

LATERAL:

- Anterior root → LMNL
- Posterior root → Pain, parasthesia

CENTRAL:

- PYRAMIDAL TRACT → UMNL below level
- SPINOTHALMIC TRACT → Superficial Sensory loss
- POST COLOUMN → Deep sensory loss

INVESTIGATIONS

- MRI (OF CHOICE)
- CT scan
- Plain x-ray

TREATMENT

LATERAL

- Conservative →
(Rest, NSAIDS, Ms. Relaxants, physiotherapy ..)
- SURGICAL → According to pain, motor, sensory loss

CENTRAL

- Full-laminectomy
- Hemi-laminectomy
- Micro-laminectomy

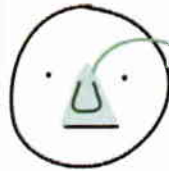
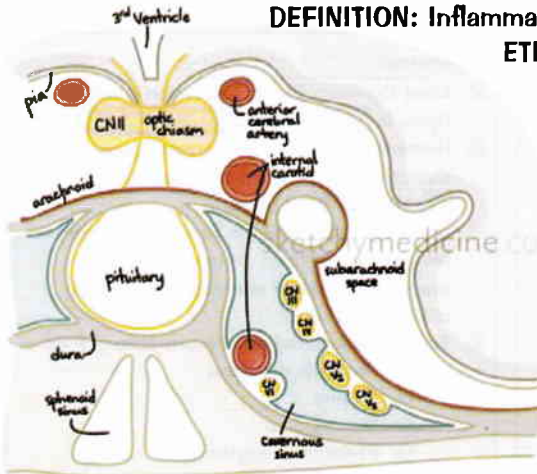
TREATMENT

- Neck collar
- Analgesics
- Urgent decompression

CAVERNOUS SINUS THROMBOSIS

DEFINITION: Inflammation with Thrombosis of cavernous sinus
ETIOLOGY:

- **ORGANISM:** Pyogenic organisms
- **ROUTE:** Hematogenous along communicating veins, Endogenous infections
- **PDF:** ↓ Immunity



**DANGER
ZONE
OF THE
FACE**

CLINICAL PICTURE: As Any infection +

- 1- Severe Supraorbital pain
(ophthalmic branch of 5th C.N.)
- 2-Edema over Mastoid bone
(Thrombosis of Mastoid emissary veins)
- 3-Proposis
- 4-Pupil Dilatation, Total Ophthalmoplegia
(ocular motor nerves: 3rd, 4th, 6th N.)
- 5-Fundal changes: papilledema, engorgement of retinal veins



TREATMENT:

- **HOSPITALIZATION IN ICU**
 - Rest, Tonics, Analgesics
 - Massive doses of systemic antibiotics
 - Anticoagulants
 - Corneal protection
- **TTT. OF COMPLICATIONS**



Head & Spine injuries:

- ✓ **POND FRACTURE:** is a simple depressed fracture in children in which the bone is usually indented rather than fractured, Dura usually intact and this type of fracture usually corrects itself by time with growth of the skull
- ✓ Investigation of Choice in a head trauma with altered level of consciousness → CT scan
- ✓ Best TTT Bleeding from wounds or incision of Scalp → **Eversion of Glia apponeurotica**
- ✓ In prolonged ↑ICT **ABDUCENT NERVE** is the most affected Nerve (Thin, runs a long course in Cranial cavity)
- ✓ Emergency reduction of ↑ICT → **Hyperventilation**
- ✓ Signs of Fracture of Posterior Cranial fossa **DOESN'T include XII CN injury**
- ✓ Cerebro-spinal Otorrhea is caused by **Parietal bone fracture**
- ✓ Spinal Cord injury is suspected with:
 - Victim of Significant trauma
 - Pain, tenderness of Neck, Abdominal Respiration, Priapism
- ✓ Optic nerve usually escape in case of anterior cranial fossa injury as it is protected by the bony canal {optic canal}
- ✓ 12th cranial nerve usually not injured in posterior cranial fossa injury as it presents in the condyloid foramen and protected by the condylar process
- ✓ In fracture base of the skull :usually a fissure one which runs through the weak points

Nerve injuries:

- ✓ Pseudomotor affection = Loss of Gland activities "Anhydrosis"
- ✓ Superficial peroneal N. is responsible for sensation in 1st, 2nd, 3rd toes
- ✓ Sympathectomy is Most effective in **CAUSALGIA**
- ✓ Accessory N. → **TRAPEZIUS**, Sternomastoid Ms.
- ✓ Complete claw hand occurs in:
 - klumpkes palsy
 - Costo-clavicular \$
 - Combined ulnar & median nerve injury
 - Volkmann's ischemic contracture,
 - Dupuytren's contracture, post-burn scar contracture
- ✓ The result of nerve is better in pure motor nerve controlling the coarse movement e.g: radial & is worst in mixed nerve e.g: ulnar & median
- ✓ Root of origin of
 - Radial nerve: C5,6,7,8 & T1
 - Median nerve: C5,6,7,8 & T1
 - Ulnar nerve: C7,8, T1



Tumors:

- ✓ Most Common Metastatic lesion involving Spine is **SECONDARY FROM PROSTATE**
- ✓ Herniation of Uncus of Temporal lobe through tentorial notch → Pressure on **III CN** → Dilated fixed pupils
- ✓ Herniation of Cerebellar Tonsils into Foramen Magnum in midbrain → Respiratory irregularity, loss of consciousness, Neck stiffness, Head tilt
- ✓ Tumors associated with Neuro-fibromatosis :
 - Acoustic neuroma
 - Glioma
 - Meningioma
 - Pheochromocytoma
- ✓ Acoustic Neuroma
 - Arise from Neuromuscular lemma of Acoustic N.
 - Bilateral, Associated with "Café au lait patches"
 - Grows slowly in Cerebellopontine angle
 - May cause cerebral & pyramidal signs

Miscellaneous:

- ✓ Skin Manifestations of Spina Bifida Occulta include :
 - Tuft of hair
 - Skin dimple
 - Skin Hemangioma
- ✓ Most common symptom of prolapsed Lumbar disc → **Radicular Sciatic pain**
- ✓ The most important cover to the brain is DURA Matter



- Give a short account on Glasgow coma scale
(kasr: 2008)
- Give a short account on depressed fracture of skull
" C/P , Investigations and management "
(kasr: 2008)
- A--- yrs old boy resented to the emergency room with history of fall from height. He was comatosed with stable vital signs and had clear fluid coming out from his nose.
- What's your diagnosis? Describe the rest of the C/P and TTT of this condition ?
(kasr: 2009)
- Diagnosis of extradural hematoma, Treatment
(kasr: 2007, 2011- Ein shams: 2002, 2005, 2007, 2010-3 in shams: 2002, 2005, 2010 -
Azhar F: 2007, 2006, 2001 - Azhar M: 2012, 2009, 2007, 2006, 2004, 2002, 2000 -
Azhar F: 2001- Azhar M: 2012, 2009, 2007, 2006, 2004, 2002, 2000)
- Describe clinical picture of cutting Ulnar/ Radial / median nerve at wrist / elbow
(3 in shams: 2000 , 2002, 2008, 2011 - Azhar F: 2005, 2004, 2012)
- Clinical Picture , investigations and ttt of carpal tunnel syndrome
(Azhar F: 2009)
- Spinal Canal Compression
(Azhar F: 2012)



SURGI- TOONS

PLASTIC SURGERY



Michael Safwat
MBBCh - An shams university

PLASTIC SURGERY

- BURNS
- SKIN CLOSURE
- SOFT TISSUE SARCOMA
- AESTHETIC SURGERY
- BED SORES
- PIGMENTED SKIN LESIONS
- MALIGNANT MELANOMA
- NON-MELANOTIC SKIN TUMORS
- TONGUE ULCERS
- CANCER TONGUE
- SWELLINGS OF THE JAW
- CLEFT LIP AND CLEFT PALATE
- MISCELLANEOUS TOPICS



BURNS

Definition:

Necrosis of tissues by Physical or chemical agents

SUPERFICIAL

جرح أحمر و مفق

1ST DEGREE

E.x. Sunburns حروق الشمس

- ☑ Affects Epidermis
- ☑ Blisters surrounded by erythema
- ☑ Surface is Moist
- ☑ Painful, sensitive to air
- ☑ Heals **Rapidly**

2ND DEGREE

E.x. حروق الزيت في قلى البطاطس

- ☑ Affects Epidermis + Part of dermis
- ☑ Moist, erythematous
- ☑ Painful, sensitive to air
- ☑ Heals **LATE** .. by epidermal regeneration from remnants of sweat glands provided that there's no infection

DEEP BURNS

جرح أسود أو أبيض

3RD DEGREE

- ☑ **COMPLETE DESTRUCTION** of Epidermis + dermis
- ☑ White or black eschars, area is dry
- ☑ **PAINLESS**
- ☑ **NO** Healing .. Skin grafts are needed

ASSESSMENT OF BURNS ACCORDING TO EXTENT:

في الكبار ..
الرأس و كل ذراع 9% و الباقي 18%

RULE OF 9

MINOR

CHILDREN
< 10% Total
body surface
area

ADULT
< 15% Total
body surface
area

INTERMEDIATE

CHILDREN
10- 30 %
Total body
surface area

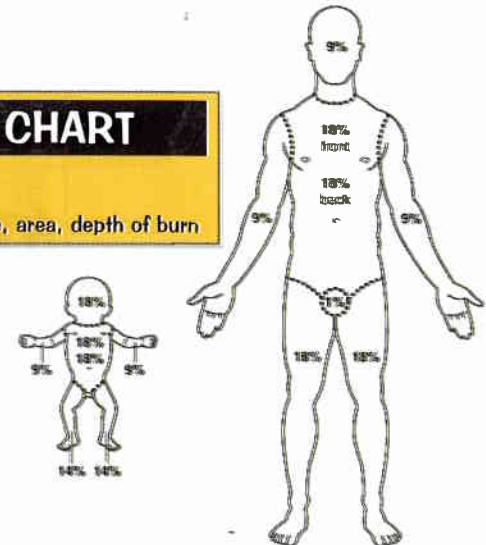
ADULT
15- 30 %
Total body
surface area

MAJOR

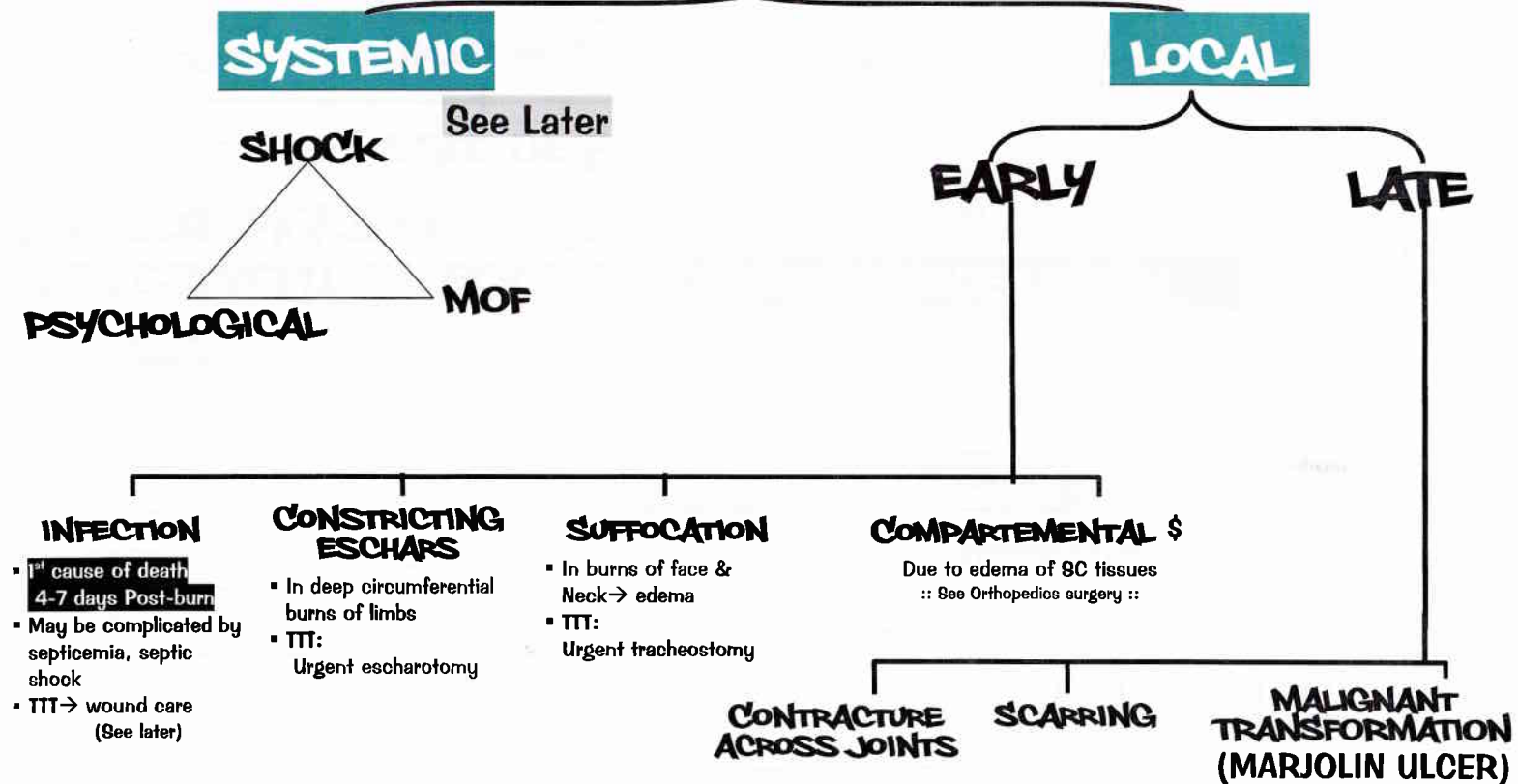
> 30 %
Total body
surface area

LUND & BROWDER CHART

- ☑ More accurate in all age groups
- ☑ **MORE COMMON IN CHILDREN**
- ☑ Based upon Correlation between Age, area, depth of burn



COMPLICATIONS OF BURNS



SYSTEMIC COMPLICATIONS OF BURNS

SHOCK

- IMMEDIATE → Neurogenic shock
- EARLY → Hypovolemic shock
- LATE (>1 week) → Septic shock

PSYCHOLOGICAL

- Anxiety
- depression

PULMONARY

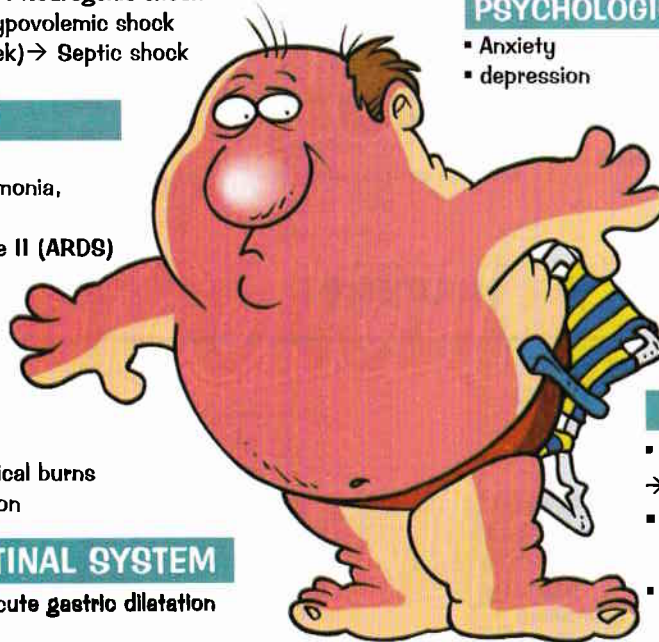
- Immediate → Asphyxia
- Early → Pneumothorax, pneumonia, pulmonary Embolism
- Late → Respiratory failure type II (ARDS)

CVS

- Acute LVF
- Congestive HF
- Arrhythmia.. electrical burns
- Myocardial infarction

GASTRO-INTESTINAL SYSTEM

- ADYNAMIC ILEUS: Acute gastric dilatation
- CURLING ULCER:
Mainly in 2nd part of duodenum & treated by
EMPERICAL Omeprazole, Antibiotics & Antifungals
- LIVER DYSFUNCTION



ENDOCRINE

- ↑ Catecholamines
- ↑ Cortisol + ADH → Na, H₂O retention
- ↑ Protein Catabolism → -ve Nitrogen balance, ↑ Glycogenolysis

RENAL

- ACUTE TUBULAR NECROSIS (reversible)
→ ACUTE CORTICAL NECROSIS (irreversible)
- MYOGLOBINUREA, HEMOGLOBINUREA
(With electrical burns)
- ACUTE RENAL FAILURE
(Secondary to hypovolemic shock)

Septic

- UTI
- Burn wound sepsis
- Pneumonia
- Septic shock
- Septic thrombophlebitis

TREATMENT OF BURNS

MINOR BURN

- ☒ Clean with Betadine
- ☒ Dressing with Silver sulpha Ointment + Vaseline Gauze dressing
- ☒ Analgesics & antibiotics
- ☒ repeat dressing for 2 weeks till healing

☒ اغسل و انشف
☒ 2 حروق :
☒ مرهم حروق و شاش حروق
☒ 2 عادي :
☒ شاش عادي و قطن عادي
☒ تلفهم

MAJOR BURN

- ☒ STOP, DROP & ROLL
(Remove Pt. from source of burn, Remove patient's clothes)
- ☒ ABCDE
- ☒ Fluids run ... water **طفيه بالياه بعد ما تشيل هدمومه**
- ☒ Admission & resuscitation (Cannula, Ryle, line, catheter)
- ☒ Monitoring Vital signs (BP, Pulse, Temp, Urine output ... best 30-50 ml/hour)
- ☒ Lab. Tests (CBC, KFT, LFT, ABGs, serum Electrolytes)
- ☒ Estimate Burn size & depth
- ☒ DRUGS → Anti-tetanic IG & Vaccine, BS spectrum Antibiotics, Antacids (to prevent Curling ulcer), Analgesics (IV Morphine)

FLUIDS

PARKLAND'S FORMULA

- ☒ Crystalloids → Ringer Lactate
- ☒ $4\text{ml} \times \text{Kg} \times \text{percent surface area burn}$
Maximum % of burn calculated is 50%
- ☒ For the first 48 hours
 - 1st 8 hours → 1/2 dose
 - 2nd 8 hours → 1/4 dose
 - 3rd 8 hours → 1/4 dose
 - 2nd day → 1/2 original dose
- + 0.5ml/kg% burnt area colloid
- Provide the daily caloric needs**
+ 2000ml Glucose 5%

Monitor adequacy of IV fluids by Vital signs & urine output, Hematocrit value

EVAN'S FORMULA

- ☒ Colloids + Crystalloids
- ☒ $1\text{ml} \times \text{Kg} \times \text{percent surface area SALINE} + 1\text{ml} \times \text{Kg} \times \text{percent surface area COLLOID} + 2000\text{ml Glucose}$
- ☒ 2nd day → 1/2 doses of the 1st day

NUTRITION

- ☒ Proteins
- ☒ CHO, lipids
- ☒ Vitamins, trace elements
- ☒ Route :
 - < 20 % ... Orally
 - 20-40% ... Enterally
 - > 40 % ... Parentrally

MONITORING NUTRITION:

- Weighing patient daily
- Plasma protein level in blood
- Progressive wound healing & ability to combat infection

LOCAL TTT

EARLY

- INFECTION WOUND**
- ☒ Escharotomy
 - ☒ Fasciotomy
 - ☒ Topical Anti-microbial agent

LATE

- ☒ Escharotomy
- ☒ Skin graft
- ☒ Prevent other Late complications

OPEN METHOD

CLOSED METHOD

	OPEN METHOD	CLOSED METHOD
Definition	Exposure of wound under aseptic conditions	Covered by bulky occlusive dressing
Site	▪ Face, Neck ▪ One side of trunk	▪ Circumferential burns ▪ Limbs
Advantages	▪ ↓ Repeated dressing ▪ ↓ Anaerobic infections	▪ ↓ Cross infections ▪ ↓ fluid loss, Edema

SKIN CLOSURE

SKIN GRAFTS

Segment of epidermis & dermis completely cut off from its blood supply, Nutrition Depends on **DIFFUSION FROM SERUM**

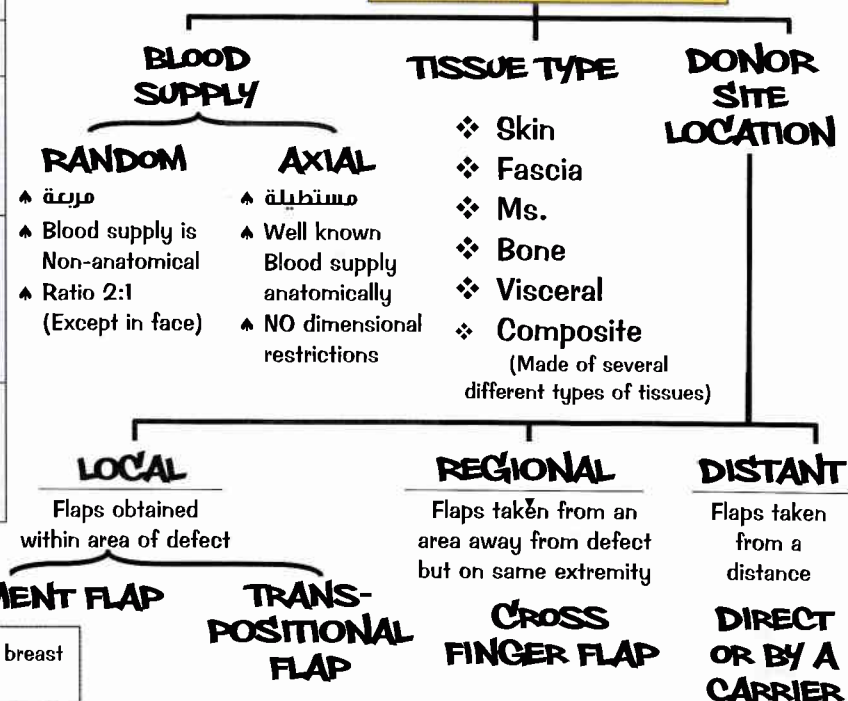
	SPLIT THICKNESS (THIERSCH GRAFT)	FULL THICKNESS (WOLF GRAFT)
	Epidermis + SUPERFICIAL part of dermis	Epidermis + FULL THICKNESS of dermis
Donor	- Trunks, thighs - Upper arm, forearm	- Post-auricular - Supra-clavicular
Indications	- Cover large areas of granulation tissue - Cover deep burn - Cover after Malignancy resection	- Facial burns - Cover Palm, plantar surface of feet - Cover Site of pressure (e.g. sole of foot)
Advantages	- Early separation, application ↑ TAKE by graft - Cover wide area - Detection of recurrence of malignancy	- Direct closure of donor site - Minimal contracture - Better sensation - Better cosmeses
Dis-advantages	- Liable to Contracture, Pigmentation ↓ Resistance to trauma ↓ Sensation, cosmeses	- Limited donor site - Less TAKE by graft - Favourable granulation tissue - Scar at donor site

SKIN FLAPS

Tissues to be Transferred from one site of the body to another site with their Blood supply

INDICATIONS OF SKIN FLAPS:

- Wound with poor vascular bed
- Reconstruction of facial features
- When sensation is required



N.B.

- Myocutaneous flap** → Used after Modified radical mastectomy of breast
- Oseomyocutaneous flap** → used after commando operation

SKIN & SOFT TISSUE LESIONS

BENIGN SKIN LESIONS

:: See General Surgery ::

- ♣ Sebaceous cyst
- ♣ Dermoid cyst
- ♣ Neurofibromatosis
- ♣ Lipoma
- ♣ Congenital vascular anomalies

PRECANCEROUS SKIN LESIONS

- ♣ Squamous Keratosis
- ♣ Bowen's disease
- ♣ Xeroderma Pigmentosa

MALIGNANT SKIN LESIONS

- ♣ Basal cell carcinoma
- ♣ Squamous cell carcinoma
- ♣ Malignant melanoma

SOFT TISSUE SARCOMA

♣ DEFINITION:

Malignant Connective Tissue tumor arising in the extra skeletal connective tissue

♣ INCIDENCE: 5th & 6th decade of life

♣ ETIOLOGY: Unknown but may follow ...

- Radiation for other malignancies
- In patient with VON RECKLENHAUSEN \$,
- On top of chronic post mastectomy arm edema

♣ TYPES:

- Liposarcoma
- Rhabdomyosarcoma
- Fibrosarcoma

♣ CLINICAL PICTURE:

Painless swelling enlarging over several months

(Delayed presentation so the tumor is large since 1st presentation)

O/E: Soft or firm in consistency according to amount of deposited collagen

♣ INVESTIGATIONS:

- For diagnosis: Biopsy : FNABC or open biopsy
- For staging : x ray ,CXR, CT scan

♣ TREATMENT:

- OPERABLE:

- 1) 1st line: Enucleation
- 2) 2nd line: Amputation is indicated if resection will lead to useless limb

- INOPERABLE:

- 1) 1st line: combination chemotherapy is the main line of palliation
- 2) 2nd line: palliative surgical excision may be added



AESTHETIC SURGERY



DEFINITION:

Surgery to improve appearance, correction of any disfigurement and it is very important to select patients for that type of surgeries as there is no pathology to correct

EXAMPLES OF AESTHETIC SURGERY:

- Liposuction
- Face lifting
- Eye lid surgery

BED SORES

❖ DEFINITION:

A localized area of the soft tissue injury resulting from compression between a hard prominence & an external surface. It is a type of a vascular necrosis

❖ PATHOLOGY:

☒ Stages..

1. Non-blanchable erythema
2. Partial thickness skin loss (epidermis Manifested as : abrasion ,blister ,shallow crater)
3. Full thickness skin loss (SC tissue is exposed)
4. Muscle or bones are exposed (tissue necrosis of any supporting structure)

☒ Sites: common anatomical pressure points

❖ COMPLICATIONS:

- ☒ General :Bacteremia ,septicemia ,toxemia
- ☒ Local: osteomyelitis, cellulites, pyo-arthritis

❖ TREATMENT:

☒ Prophylaxis { most important}

- 1) Reposition every 2 hrs.
- 2) Air matters
- 3) Skin care & improve general condition

☒ Definitive TTT:

- 1) Stage 1: as prophylaxis ,more frequent turning of the patient
- 2) Stage 2: as 1+dressing to prevent dryness of wound
- 3) Stage 3.4: Debridement

- Chemical (Small wounds): Saline dressing, Irujol
- Surgical (Large wound): Myocutaneous Flap



PIGMENTED SKIN LESIONS

BENIGN MELANOMA

MOST COMMON TUMOR IN HUMANS

LENTIGO نيكول سابا	JUNCTIONAL PIGMENTED NAEVUS شادية فى ذفاق المدق	COMPOUND NAEVUS حسن الأسمر	INTRADERMAL NAEVUS
Melanocytes replace basal layer of epidermis	Melanocytes form nodules in Epidermis	Melanocytes pass to dermis	Melanocytes present in dermis with junctional activity
<u>CLINICALLY:</u> Flat spot	<u>CLINICALLY:</u> Flat spot	<u>CLINICALLY:</u> Black nodule raised above surface of skin	

TREATMENT:

Most cases require NO TREATMENT EXCEPT:

- For cosmetic reasons, subjected to repeated trauma, suspected to turn malignant
- Giant hairy naevi → must be excised

MALIGNANT TRANSFORMATION

إمتى تتقلب؟؟

- Giant Hairy pigmented Naevi
- Junctional Naevi
- Chronic irritation (shaving)
- Incomplete excision

إزاي تعرف؟؟

- Asymmetrical, Irregular border
- Dark color
- Hard consistency
- Change in behavior
- Painful, itching, LNs++

MALIGNANT MELANOMA

"DENOVO > ON TOP OF BENIGN"

PREDISPOSING FACTORS:

- Prolonged exposure to Sunlight (UV rays)
- ↑ incidence in Albinism, Retinitis pigmentosa
- On top of Benign melanoma (if exposed to chronic irritation)



- Most Common Malignant Melanoma :** Superficial Spreading melanoma
- Best Prognosis Malig. Melanoma :** Superficial Spreading melanoma
- Worst Prognosis :** Nodular Melanoma

CLINICAL PICTURE:

SYMPTOMS:

- Denovo presentation
- Malignant on top of Benign naevus
- Occult presentation
- Transit metastasis after removing 1ry tumor

SIGNS:

- Nodule or ulcer, satellite lesions
- LNs enlargement, liver metastasis

INVESTIGATIONS:

- Diagnosis → Biopsy
- Staging → Sentinel LNs
- Pre-op investigations

MALIGNANT MELANOMA

SUPERFICIAL SPREADING

- Most common (50-70%)
- **Site:** NO SITE OF PREDILECTION
- **Character:** raised above surface with irregular edge
- Best prognosis (Radial growth)

NODULAR MELANOMA

- **Site:** Trunk, head, neck
- **Character:** Raised above surface with smooth surface
- Worst Prognosis (Vertical growth)

ACRAL LENTIGINOUS

- OLD age (>60 years)
- Dark skinned patient
- **Site:** SOLE, palm, under nail
- Poor prognosis (Radial then vertical growth)

AMELANOTIC MELANOMA

- Ulcer resistant for healing
- **DD:** BCC, SCC
- **DIAGNOSED BY:**
DOPA reaction test & Biopsy

LENTIGO MALIGNA

- تیتانیک**
- Old age
 - **Site:** Face

MALIGNANT TRANSFORMATION

- مين الى يقلب ؟
- إزای تعرف ؟

TREATEMENT

OPERABLE

- 1) Surgical excision with safety margin
 - 1cm ... if thickness <1mm
 - 2cm ... if thickness 1-4mm
 - 3cm ... if thickness >4 mm
- 2) For LNs :
 - If LNs are enlarged, firm → Radical dissection
 - If not clinically apparent → Sentinel LN study
 - # Prophylactic dissection

IN-OPERABLE

- 1) Palliative excision
- 2) Chemotherapy (Actinomycin D)
- 3) Immunotherapy (Interleukin 2)
- 4) Radiotherapy

BRESLOW CLASSIFICATION

PREDICT PROGNOSIS

Stage	Infiltration
I	<0.75 mm
II	0.75 -1.5 mm
III	1.75 -4 mm
IV	> 4mm

Prognosis depends on DEPTH !!



NON MELANOTIC SKIN TUMORS

BASAL CELL CARCINOMA

DEFINITION: Locally malignant tumor from basal layer of skin

PREDISPOSING FACTORS:

- UV rays
- Xeroderma pigmentosa
- Radiation, immunocompromisation
- BOWEN's DISEASE ... single erythematous scaly plaque
- Leukoplakia

PATHOLOGY & CLINICAL PICTURE

Male >40 years, Fair colored, Farmer or sailor
 جالہ حسہ بکتر ... ہر شہا ایتورت و میتخفش

NODULE "EARLIEST"

- In face (90%)
(Inner canthus, Nasolabial folds)
- Slowly growing & Painless
- White with dilated capillaries Over it

RODENT ULCER "MOST COMMON"

Site	Face, above line joining tragus with angle of mouth
Shape	Rounded or Oval
Number	Single
Base	Indurated
Floor	Early mobile & late fixed
Edge	Necrotic
LN's	NOT enlarged
	(LOCALLY MALIGNANT)

MICROSCOPIC PICTURE

PALLISADE APPEARANCE .. Prickle cells surrounded by Basal cells, separated by fibrous stroma

SQUAMOUS CELL CARCINOMA

DEFINITION: Malignant tumor from skin squamous epithelium

PREDISPOSING FACTORS:

As BCC + ...

- MARJOLIN ULCER
- Prolonged exposure to carcinogenic agents (e.g. coal tar derivatives)

PATHOLOGY & CLINICAL PICTURE

NODULE "EARLIEST"

Rapidly growing

ULCER "MOST COMMON"

Site	Site covered by squamous epithelium
Shape	Rounded or Oval
Number	Usually Single
Base	Indurated then Becomes fixed
Floor	Necrotic
Edge	Everted
LN's	Enlarged (MALIGNANT)

MICROSCOPIC PICTURE

DIFFERENTIATED

Cell Nests
(Prickle cells + keratin in center)

ANAPLASTIC

Anaplastic cells
(no keratin → Bad prognosis)



ازای ال BCC یتحول ل SCC ؟

- Edge become Everted
- LN's are Hard, fixed

INVESTIGATIONS

- 1) Excisional Biopsy → Confirmatory .. (microscopic picture)
- 2) X-ray → Infiltration (Rodent ulcer)
- 3) Sentinel LNs study in SCC

TREATMENT = SURGICAL EXCISION

- ☒ With safety margin **0.5 cm**
- ☒ Elliptical incision.. for cosmetic purposes
- ☒ Raw area is covered by Graft

- ☒ With safety margin **2 cm**
(in Face : 1cm)
- ☒ Elliptical incision.. for cosmetic purposes
- ☒ Raw area is covered by Graft or by primary closure
- ☒ If Enlarged LNs → Block Dissection

#Prophylactic
dissection of
LNs

**IF UNFIT FOR SURGERY → RADIATION****CONTRA-INDICATIONS:**

- ☒ Infiltrating bone, cartilage .. avoid irradiation necrosis
 - ☒ Near the Eye.. avoid irradiation cataract
 - ☒ Recurrence after radiation .. avoid irradiation
- Resistance (super-selection)

CONTRA-INDICATIONS:

- ☒ As BCC +
MARJOLIN ULCER

RECENTLY → MOH'S MICROGRAPHIC SURGERY

Remove tumor layer by layer till reaching surrounding healthy tissue

→ Success up to 99% زى مكّة الانشوة

The Treatment of Choice in cancer of face & sensitive areas

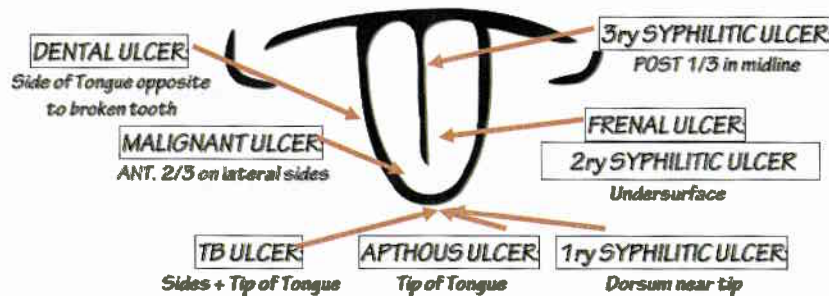
OTHERS LINES OF TREATMENT :

Cryosurgery, Topical cytotoxics (5FU), photodynamic therapy

TONGUE ULCERS

+ MALIGNANT ULCER (SEE LATER)

	DENTAL	FRENAL	APTHOUS	LICHEN PLANUS	HERPETIC	TB	SYPHILIS		
							PRIMARY	SECONDARY	TERTIARY
Site	Side of Tongue opposite to broken tooth	Undersurface of Tongue (In Pts. With whooping cough)	Tip of Tongue	Auto-immune disease with tongue ulcer + Hyperkeratotic lesions	Anywhere But DOESN'T CROSS MIDLINE ↓ Unilateral eruption of small vesicles on the tongue and cheek, that leave small superficial areas of ulceration after eruption	Sides & Tip	Chancre on Dorsum near the tip Heals spontaneously within 6 weeks	Snail track ulcer on undersurface & sides of tongue	Post 1/3 Always in Midline
Size	Small	small				small			
Shape	Oval	Oval	Rounded			Oval			
Floor	Granulation tissue					Caseous material			Yellowish wash-Leather slough
Base	SOFT		Soft			SOFT			PUNCHED OUT
Edge	SLOPING		RED			UNDERMINED			
LN's	+ ve		Not Enlarged			+ ve			
Pain	PAINFUL		PAINFUL			PAINFUL			
Treatment	Remove tooth & Biopsy		Mouth wash, anesthetic gel			Anti-TB drugs + anesthetic Paint			



CANCER TONGUE

MOST COMMON INTRA-ORAL TUMOR

ETIOLOGY "PREDISPOSING FACTORS"

- Chronic irritation (S)
- Benign tumors (papilloma)
- Pre-cancerous lesions (Leukoplakia)

PATHOLOGY

- Site → Lateral side of tongue
- Macroscopic, Microscopic picture ... As SCC

SPREAD

- Direct, Blood Lymphatic

CLINICAL PICTURE

TYPE OF PATIENT → Old male > 50 years

SYMPTOMS

- Painful ulcer, ↑↑ Salivation, Dysphagia

SIGNS

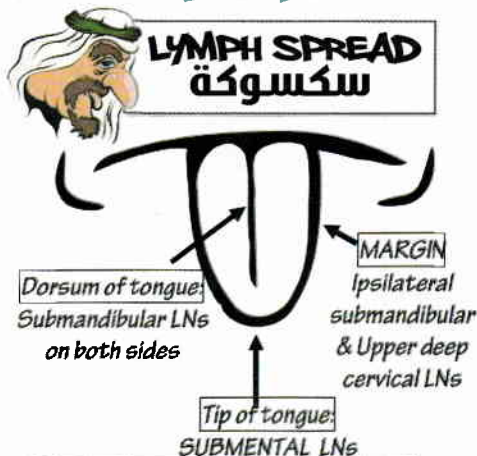
- Foeter oris
- Ulcer
- Tender, Elastic LNs (infection) & Fixed, hard LNs (malignancy)

INVESTIGATIONS

Best is excisional Biopsy with 1cm safety margin

COMPLICATIONS

- Inhalation Pneumonia
- Infection, secondary hemorrhage



MALIGNANT ULCER

Site	Anterior 2/3 of Tongue.. Side of Tongue opposite to broken tooth
Size	Variable
Number	Single
shape	Cauliflower or papillary
Floor	Hemorrhage & necrosis
Base	Indurated & Infiltrating
Edge	Raised & everted
LN's	+ve early mobile, late fixed
Pain	painful

TREATMENT

RADICAL TTT. FOR EARLY CASES

SURGICAL

- INDICATIONS:** Small growths, Incomplete regression or recurrence, Cancer on top of pre-cancerous lesions, If close to mandible
- PRE-OPERATIVE:** Irradiation by 4000rad
- RESECTION PROCEDURES:**

CIS	Excision with safety margin: 1cm on sides, 0.5cm in depth
ANTERIOR 2/3	Partial glossectomy, hemi-glossectomy or near glossectomy with safety margin 1.5cm
POSTERIOR 1/3	Total glossectomy
UNILATERAL LN's METASTASIS	Completer neck dissection
BILATERAL LN's METASTASIS	Complete neck dissection, or selective neck dissection on less affected side
MANDIBLE	Commando operation with Osteo-myocutaneous flap

RADIOTHERAPY

- INDICATIONS:** T₁, T₂ (<4cm)
- METHODS:**
 - BRACHYTHERAPY
 - TELETHERAPY

PALLIATIVE TTT FOR ADVANCED CASES

- INDICATIONS:**
 - Unresectable 1ry growth
 - Fixed LN's in the neck
 - Distant metastasis
- METHODS:**
 - Radiotherapy
 - Palliative resection
 - Analgesics, NG feeding
 - Chemotherapy

SWELLINGS OF THE JAW

BONE TUMORS

BENIGN

- Chondroma
- Osteoma
- Osteoclastoma

:: See orthopedics ::

MALIGNANT

**PRIMARY
CANCER
MAXILLA**

- **PATIENT:** young adult, old age
- **CLINICAL PICTURE:**
 - Early → dull aching pain, referred to the teeth
 - Late:
 - ✧ Unilateral nasal obstruction
 - ✧ Epistaxis
 - ✧ Swelling of check
 - ✧ Epiphora, proptosis
- **TREATMENT**
 - **EARLY (OPERABLE) →** Total radical maxillectomy
 - **LATE (INOPERABLE) →** Localized excision of maxilla

▪ N.B.

**NO ROLE FOR
RADIOTHERAPY**

DENTAL TUMORS

CYSTIC

- Dental
- Dentigious

SOLID

- Ameloblastoma

	DENTAL	DENTIGIOUS
Patient	Adult	Children
Site	Upper Jaw	Lower Jaw
Etiology	Decayed tooth	Missing 3 rd Molar
X-ray	NO TOOTH	Contain a TOOTH
TTT	Tooth extraction & Curettage of Cyst	

AMELOBLASTOMA (ADAMANTENOMA)

بنت عندها 20 سنة مصدغة و عندها كلكوعة
مبتوحهاش عند ال angle of the mandible
أصحابها سألوها ليه ضاربة صدغ كده لكن هي مكانتش
ملاحظة .. لما إنكث عليها عملت :
Egg shell crackling sensation
راحت عملت أشعة ... أظهرت Soap bubble appearance (Honey comb appearance)
قام الدكتور شالهاها و رفع لها الفك بحتة من الضلوع
(Excision & bone grafting)



AMELOBLASTOMA	OSTEOCLASTOMA
Painless swellings, Egg-shell crackling sensation	
Angle of Mandible	Symphysis menti
Vertical & horizontal growth	Horizontal growth
Equal lobulations	UN-equal lobulations

Differentiated ONLY by BIOPSY

GUM TUMORS (EPILUS)

FIBROUS

- **MOST COMMON FORM**
- **Site:** Mandible between Incisors
- **Clinical picture:** Slowly growing painless firm swelling covered by intact mucous membrane
- **Treatment:** Teeth extraction , Excision of tumor

GRANULOMATOUS

- **Site:** Around a carious tooth
- **Macroscopic picture:** Red, Soft, **LOBULATED MASS**
- **Clinical picture:** Bleeds on touch
- **TTT:** Excision & Removal of tooth + Histological examination

MYELOID

- Well defined sessile swelling covered by intact mucous membrane
- Causes **SERIOUS HEMORRHAGE**
- **Microscopic picture:** Giant Stem cells
- **TTT:** Wide excision

CARCINOMATOUS

- **OLD** Male
- **Spread by:** LYMPH SPREAD
- **TTT:** Commando operation

SARCOMATOUS

- Young Male
- **Spread by:** BLOOD
- **BAD PROGNOSIS**

CLEFT LIP CLEFT PALATE

2nd MOST COMMON CONGENITAL ANOMALY (After hand anomalies)

CLEFT LIP (HARE LIP)

DEFINITION: Failure of fusion between median part of fronto-nasal process & one or both lateral maxillary processes in a developing face

INCIDENCE:

- 85% Unilateral cases
- Most common Complication is CLEFT PALATE

TYPES:

- In Upper Lip → Lateral فوق على الجنب
- In lower lip → Median تحت في النصف

DIAGNOSIS:

- Antenatal diagnosis by U/S > 18 weeks Gestation
- Flaring & Flatness of Nares, disfigurement
- Difficult suckling, Nasal tone منخر بيه
- Associated congenital anomalies (35%)

TREATMENT:

MILLARD'S OPERATION

- At 3-6 months
- Infant should be at least weighing 10 pounds
- Hb level 10 mg%



CLEFT PALATE

TYPES:

- Cleft uvula
- Cleft soft palate
- Inter-maxillary cleft
- Bi-partite, Tri-partite cleft

DIAGNOSIS:

- Antenatal diagnosis by U/S after 18 weeks Gestation
- Impaired suckling, speech, Dentation
- Recurrent Infections

TREATMENT:

PRE-OPERATIVE:

- Attention to feeding, use spoon or bottle with a large hole in an upright position
- Prevention & TTT. of Chest infection

ACTIVE TREATMENT:

- At 12-18 months
- Objectives of surgery: closure of oro-nasal communication & achieving a competent velo-pharyngeal sphincter

POST-OPERATIVE:

- Speech therapy & Orthodontic TTT

ETIOLOGY:

- Genetic predisposition
- Environmental factors (Drugs, irradiation, viral, infections)
- Mechanical causes (e.x. Oligohydramnios)
- May be associated by "Pierre Robin s"

MISCELLANEOUS TOPICS

MAXILLOFACIAL TRAUMA "LE FORT FRACTURES"

LE FORT I

البق

- Horizontal maxillary fracture
- Above the level of the teeth
- **TREATMENT:**
Intermaxillary fixation to inferior orbital margins by wires

LE FORT II

البق + المناخير

- Pyramidal fracture
- At Base of the nose ,posterior wall of maxillary antrum & across the orbit
- TTT: intermaxillary fixation to zygomatic process of frontal bone by wires
- Hypothesia (it' near exit of infra-orbital N.)

LE FORT III

البق + المناخير + العينين

- Craniofacial dysjunction
- Separate facial bone from cranial attachment
- TTT: as Le Fort 2 + ...
Correction of nasal & zygomatic fracture

- **DIAGNOSIS .. Best investigation is CORONAL CT SCAN**

HAND INJURIES

Indication for replantation of an amputated digit:
Thumb amputation, If In children, clean wound
Contraindication to replantation:

- Absolute: sever medical problems ,multilevel injury to amputated part, inability to stop smoking for 3 months post replant & psychiatric illness
- Relative: sever crush, avulsion ,heavily contaminated wound & amputation between MCP&PIP joints of a single digit.

FLEXOR TENDON INJURIES

- ✧ Often associated with Neurovascular changes

EXTENSOR TENDON INJURIES:

- ✧ More frequent
- ✧ Often associated with articular damage
- ✧ **TREATMENT:**

- ALL FLEXOR TENDON INJURIES → Operative exploration, therapy or both
- In the E.R. → Lacerations with both ends are visualized for repair
- Multiple Tendon injuries, or difficult exposure → Attempted ONLY in the OR

MALLET FINGER INJURY

Flexion of DIP, Extension of PIP

BAUTANNIERE DEFORMITY:

Extension of DIP, Flexion of PIP

MANDIBULAR FRACTURE

- Most common site.. **CONDYLES 35%**

CLINICAL PICTURE:

- Mandibular pain
- Swelling of floor of mouth.. **"COLEMAN'S SIGN"**
- Disturbance of function (abnormal movement, looseness of teeth, hypothesia)

INVESTIGATIONS:

Best investigation is **CT SCAN**

N.B. (**PANOREX** → poor visualization for condylar fractures)

TREATMENT:

- First aid measures
(4-tailed Bandage for support, Analgesics, Antibiotics, Mouth hygiene)
- Reduction under anesthesia, Fixation by Intra-dental wiring or arch bars (3-6 weeks)
- ORIF by plate & Screw for more complicated fractures



MUSCLES, TENDONS, FASCIA



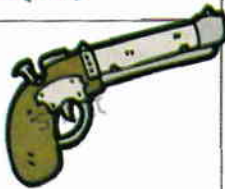
TENNIS ELBOW

- Pain in the elbow AT REST & WHILE MOVING
- ETIOLOGY: Direct Trauma to Common Extensor origin, Repeated Athletic activity
- TREATMENT: Rest, Local injection of Corticosteroid in Resistant cases

ROTATOR CUFF TENDONITIS

- MOST COMMON CAUSE OF SHOULDER PAIN
- DEFINITION: Inflammation of a tendon of Rotator Cuff Muscles → MOST COMMON IS SUPRASPINATUS
- ETIOLOGY: Repeated trauma from sports
- C/P: Painful active Abduction when Shoulder moves between 60-120 (PAINFUL ARC SYNDROME)
- TREATMENT: NSAIDs, Immobilization, Gradual active exercise after few days, Local Injection of Corticosteroid in resistant cases

STENOSING TENOVAGINITIS



TRIGGER FINGER

- Thickening of Fibrous flexor sheath at MCP joint, leading to Locking of the finger in Flexion with Local Tenderness at MCP joint
- TREATMENT: Division of Constricting Fibrous Flexor sheath

DE QUERVAIN'S TENOSYNOVITIS

- Inflammation of Tendon Sheath of: Abductor Pollicis Longus, Extensor Pollicis brevis while crossing the wrist
- C/P: Active and passive movements of the thumb exaggerate the pain & Limit movement
- TREATMENT: Division of Constricting Tendon Sheath

DUPUYTREN'S CONTRACTURE

- Progressive thickening & Contraction of Palmar aponeurosis
- Bilateral in 50% of Cases
- ETIOLOGY: Idiopathic, Familial, ↑Incidence with Cirrhosis, alcoholics, Epileptics under phenytoin TTT.
- C/P:
 - FLEXION DEFORMITY (At The MCP joint, Proximal IP Joint)
 - DISTAL INTER-PHALYNGEAL JOINT ARE FREE
- TREATMENT:
 - Physiotherapy (early)
 - Surgical treatment (Late) ... Subcutaneous fasciotomy, Aponeurosis excision



BURNS

- ✘ 75% of all burns are due to thermal agents and 25% are induced by the other agents .
- ✘ 2nd degree burn is further subdivided into
 - Superficial dermal burn: characterized by formation of bullae, extend to the outer dermis and heal within 15 days
 - Deep dermal burns: reach deeper but the skin appendages are spared and heal within 3-4 weeks.
- ✘ The presence of blisters in cutaneous burn injury
 - a partial thickness burn (second degree)
- ✘ Scalds (burns due to Hot fluids):
 - More common in children
 - Tend to be Partial thickness burn
- ✘ To determine depth of a burn → determine the type of burn, Test sensibility of the burnt area.
- ✘ Regarding Rule of 9 → the entire back accounts for 18 percent.
- ✘ The patients right upper extremity becomes cyanotic and cool, with delayed capillary refilling, loss of pulse and no flow signal on Doppler ultra sound and the nearest burn center is 3 hours away → the immediate TTT is **ESCHAROTOMY**
- ✘ In extensive burns, the fluid replacement during the first 24 hours:
 - Ringer lactate (according to parkland formula)
 - Controlled by urine output/hour
 - Should be supplemented by blood transfusion to maintain the hematocrit around 35%
 - Is calculated according to the body weight and surface area
- ✘ The most useful measure in preventing renal shut-down in post burn patient is maintaining an hourly urine output between 30 and 50 ml.
- ✘ Biological dressings for burn wounds : ↓pain, ↓protein loss, Prevents contamination
- ✘ Partial thickness burns
 - More painful, sensitive to air (Terminal N. endings still intact)
 - If kept clean it will heal within 3 weeks, Full thickness requires excision + grafting.
- ✘ **ESCHARS**
 - Inelastic dead tissue "not fibrous" results from full thickness burn.
 - Insensitive tissue... (divided as bedside procedure without anesthesia)
 - Circumferential Eschars are dangerous → Acute limb ischemia "compartmental \$", Respiratory impairment.



Skin Graft and flap

- ✘ The most common type of malignant melanoma is superficial spreading melanoma 75%.
- ✘ Giant hairy nevus **MUST BE** excised mainly because of risk of malignant transformation.
- ✘ TTT of BCC is mainly excision.
- ✘ The skin grafts harvested from a donor site and subsequently transferred to a recipient site on which it must survive, a process known as "Take" .. (refers to vascularization of graft)
- ✘ Regarding skin grafts
 - Skin graft normally "takes" within 3-4 days of grafting
 - Muscle normally provides a suitable bed for split – skin grafting.
 - Staphylococcus aureus and pseudomonas aeruginosa can result in graft failure
 - A split – skin graft can be stored at low temperature for 3 weeks before application
- ✘ Early excision + grafting dramatically improve the survival of burnt patient while role of prophylactic antibiotics is controversial.

Cleft lip and cleft palate

- ✘ **CLEFT LIP:**
 - Cleft upper lip is due to non-fusion of maxillary process with median nasal process.
 - Fusions and formation of the oral cavity take place in the 8th week intrauterine
 - Most common type of cleft lip is unilateral (left sided)
 - The aim of treatment of an infant with a cleft lip is to improve appearance.
 - Cleft lip should be repaired at the age 3 months
 - Cleft lip and cleft palate is familial in 12% of cases.
- ✘ **CLEFT PALATE:**
 - 50% of the children with Cleft palate have some degree of deafness.
 - Cleft palate repair is ideal at 6-18 months.

Carcinoma of lip & Tongue

REGARDING CARCINOMA OF LIP :

- Incidence: Most frequently squamous cell carcinoma, in the lower lip.
- It is usually low grade and well differentiated.
- If occurs at angle of mouth → More Malignant in behavior > that of upper or lower lip.
- It metastasizes via lymphatics.
- May be confused with a keratoacanthoma.
- Is curable by surgery.

REGARDING THE CARCINOMA OF THE TONGUE :

- Is more common in males.
- C/O: Symptomless (Early), It may be simply present with a lump in the neck, Alteration of the voice is an early feature of carcinoma of the back of the tongue.
- Most common Presentation → indolent ulcer.
- It may cause earache.
- Metastasize via the lymphatics at an early stage of the disease.
- In many instances the lymphatics draining the anterior 2/3 of the tongue and the floor of the mouth traverse the periosteum of the mandible.
- Causes of death in terminal stage: Hemorrhage, Bronchopneumonia, Malnutrition

Skin neoplasm

✧ Regarding basal cell carcinoma:

- Arise from the basal area of appendages
- Common form of skin cancer occurring in elderly male.
- 90% of lesions found in the face.
- Nodular type is the commonest histo-pathological variant of BCC.
- Current guidelines advice that this lesion is resected with a 5 mm margin.

✧ Regarding squamous cell carcinoma:

- A malignant tumor arising from epidermis.
- Frequently occurs in pre-existing skin lesion
- The treatment of choice is surgery, radiotherapy
- Marjolin's ulcer is skin squamous cell carcinoma on top of chronic benign ulcer or chronic scar.

✧ Regarding malignant melanoma:

- Melanocytes develops from neural crest & migrated to epidermis
- The incidence is increasing, 10% arise in a pre-existing naevus
- Sites other than the skin can be affected
- Superficial spreading melanoma is the most common histo-pathological type (75%)
- Breslow's thickness is a better prognostic indicator than clark's levels.
- Spread of malignant melanoma is Local, lymphatic and vascular.

TISSUE EXPANDERS

- DEFINITION: They are inflatable silicone implants
- SITE: They are placed subcutaneously in collapsed state

SYNDACTYLY

- AUTOSOMAL DOMINANT, M=F
- MOS COMMONLY IN 3rd WEB SPACE
- 50% Bilateral
- C/P:
 - SIMPLE: digits connected by soft tissue
 - COMPLEX: Complicated with shared bones, Nerves, vessels, Nails
- INVESTIGATIONS: X-ray, Fetal Sonogram
- TREATMENT:SURGICAL....
 - Anytime from Neonatal period to 4-5 years
 - Staged operation

POLYDACTYLY

- AUTOSOMAL DOMINANT, M=F
- C/P: Rudimentary finger or fully developed Extra-digits
- INVESTIGATIONS: X-ray, Fetal Sonogram
- TREATMENT:SURGICAL.....
 - Anytime from Neonatal period to 4-5 years
 - Staged operation



GIANT HAIRY NAEVUS

Middle aged patient presents with black or brown nodule raised above the surface of the skin with some hair arising from it, occupying large area.

MELANOMA

SUPERFICIAL SPREADING

Middle aged patient presents with pigmented nodule raised above the surface with irregular edge. The patient gives past history of prolonged exposure to sunrays or benign melanoma.

NODULAR

Patient presents with gray or black colored lesion raised above the surface with smooth surface mainly in trunk or head and neck.

ACRAL LENTIGIOUS

Dark skinned old age patient presents with black or gray colored lesion in palm, sole or under nail.

AMELANOTIC MELANOMA

Patient presents with pigmented lesion in any area of muco-cutaneous junction (eye, anal canal & meninges). DOPA reaction test is positive. The patient gives past history to benign melanoma.

BASAL CELL CARCINOMA

Male patient >40 years farmer, sailors (or any occupation with prolonged exposure to UV rays) presents with slowly growing, progressive ulcer with necrotic floor, rolled in beaded edge & indurated base in the face above line joining tragus with angle of mouth. The patient give past Hx of nodule, ulcer resistant for treatment. With NO LN enlargement.

SQUAMOUS CELL CARCINOMA

Male above 40 years ,farmer or sailor ,faired colored presents with painless nodule then ulcer resistant for treatment. The ulcer is rapidly growing with everted edge and necrotic floor, LN is enlarged

CLEFT PALATE

Neonate presents with impairment of suckling & recurrent chest infection & multiple congenital anomalies. The mother gives history to radiation exposure during pregnancy

MALIGNANT ULCER OF THE TONGUE

Male >50 years old, heavy smoker, presents with dysphagia & painful ulcer in the tongue with raised and everted edge. Pain is referred to the ear with ↑salivation and the patient spits as he find it painful to swallow his saliva. O/E tongue deviated to the side of the lesion with palpable submandibular L.N

AMELOBLASTOMA

Female patient 20-40 years old presents with painless progressive swelling of the mandible which gives egg-shell crackling sensation on examination

APTHOUS ULCER

Female patient presents with painful ulcer in the oral cavity especially near the tip of the tongue rounded with red margin with no LN enlargement

PLASTIC QUESTIONS



QUESTION
Bank!!
as2elet el benteeni ?

1. --- years old male / female patient , weighing --- kg , sustained aflame burn in a closed room resulting burn.
 - Diagnosis of burn depth and extant
(kasr : 2008 - Ain shams: 2005)
 - First aid (kasr : 2008 – Azhar m: 2007) and hospital management
(kasr : 2008 , 3in shams: 2005 – Azhar m: 2007 – Azhar f: 2007)
 - Early and late complications and possible causes of death
(kasr : 2008)
 - Local ttt of burn
(Ain shams: 2010)
 - Factors affecting prognosis
(Azhar f: 2011)
2. --- kg , --- years old female / male presented to the emergency room with a burn that affected the anterior aspect of the right leg and anterior aspect of the abdomen & chest . O/E , her vital signs were stable apart from a tachycardia of 110 , and locally the burnt area was erythematous with blisters and was sensitive to pinpricking . which fluid she will require in the first and second 24hrs.
(kasr 2008)
3. D.D of Leg ulcer
(kasr: 2008 – 3in shams: 2010 – Azhar m: 2011,2005 – Azhar f:2001)
4. Types , complications and treatment plan for cleft palate
(kasr 2011)
5. Cancer tongue : diagnosis ,ttt and prognosis
(Ain shams 2004)
6. Management of melanoma
(Ain shams: 2008)
7. D.D of ulcers of the lip
(Ain shams: 2009)
8. Basal cell carcinoma
(Azhar m: 2001 – Azhar f: 2007,2004)



SURGI- TOONS

CARDIOTHORACIC SURGERY



Michael Safwat
MBChB - Ain Shams University

TABLE OF... CONTENTS

- Cardiac arrest & CPR
- Fracture ribs
- Pneumo-thorax
- Hemo-thorax
- Empyema
- Post-operative
Pulmonary complications



"Your x-ray showed a broken rib, but we fixed it with Photoshop."

CARDIAC ARREST

DEFINITION: Sudden failure of heart to maintain circulation

ETIOLOGY:

Myocardial depression

- ☑ Myocardial anoxia ...e.g. infarction
- ☑ Metabolic :
 - 1) Hyperkalemia ... hypokalemia ...
 - 2) Hyponatremia ...acidosis
- ☑ Severe trauma
- ☑ Vagal stimulation

Inadequate venous return

- ☑ MECHANICAL:
 - Massive Pulmonary embolism
 - Pleural effusion
- ☑ Acute Hemorrhage
- ☑ General, spinal anesthesia

TYPES:

1. VENTRICULAR FIBRILLATION.. **MOST COMMON TYPE, BEST SURVIVAL RATE**
2. Asystole
3. Electromechanical dissociation

DIAGNOSIS

STETHOSCOPE HAS NO RULE IN DIAGNOSIS OF CARDIAC ARREST, ONCE THE CONDITION IS SUSPECTED.. CAROTID VESSELS ARE PALPATED TO CONFIRM THE DIAGNOSIS & START CPR

SIGNS OF CARDIAC ARREST:

- ☑ SUDDEN LOSS OF CONSCIOUSNESS
- ☑ ABSENT CAROTID PULSE
- ☑ CESSATION OF RESPIRATION
- ☑ BILATERAL DILATED FIXED PUPIL



MANAGEMENT OF CARDIAC ARREST

VARIFY DIAGNOSIS

- ☑ SUDDEN LOSS OF CONSCIOUSNESS
- ☑ ABSENT CAROTID PULSE
- ☑ CESSATION OF RESPIRATION
- ☑ BILATERAL DILATED FIXED PUPIL

BASIC LIFE SUPPORT

FIRST AID → ABCD

- ☑ **Airway**
Head tilt, chin lift
- ☑ **Breathing**
Look, listen, feel →
Mouth to mouth breathing
- ☑ **Circulation**
Cardiac massage
(15 compressions : 2 Breaths)
- ☑ **Drugs**
 - 1) IV fluids, Mannitol
 - 2) Dobutamine
 - 3) Dopamine
 - 4) NaHCO₃
 - 5) Atropine

ADVANCED LIFE SUPP

Restore NORMAL COP

- ☑ Defibrillation
- ☑ Correction of reversible causes
- ☑ Endotracheal tube
- ☑ Wide bore cannula → IV drugs

SUBSEQUENT TTT IN ICU

BP	keep >90
↑K ⁺	CaCl ₂ , glucose, insulin
HYPOTHERMIA & DEHYDRATION	
METABOLIC ACIDOSIS	NaHCO ₃
RECURRENT VF	Prophylactic Lignocaine
CONVULSIONS	Anti-convulsants

TTT OF 1^{ry} CAUSE

ECG (TO DIFF. TYPES)

ASYSTOLE

- ☑ Maintain CPR
- ☑ Intra-cardiac injection of Adrenaline

SINUS RYTHM

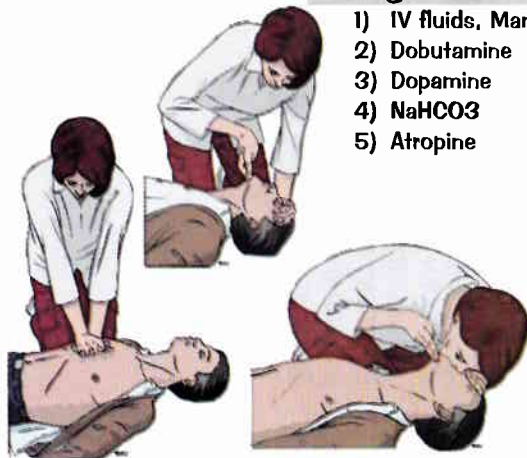
VF

VF

DEFIBRILLATION

- ☑ 200 joules
- ☑ If Failed → Repeated again
- ☑ If Failed → 360 joules
- ☑ If Failed → 1mg IV epinephrine
- ☑ If Failed → 1 minute CPR
- ☑ If Failed → 3 shocks of 360 joules

IF FAILED → OPEN CARDIAC MASSAGE



ETIOLOGY OF RIB FRACTURES

- Direct Trauma
- Muscular violence
- Pathological fracture

FRACTURE RIBS

فرض
جامد !!



SIMPLE FRACTURE

MULTIPLE FRACTURES

FLAIL CHEST

STOVE IN CHEST

	SIMPLE FRACTURE	MULTIPLE FRACTURE	FLAIL CHEST	STOVE IN CHEST
Definition	Fracture of 1 RIB at 1 site	MULTIPLE RIBS . Each at 1 point	Multiple ribs (>3 ribs) AT MULTIPLE SITES .	Fracture of multiple ribs at multiple points, Intermediate segment of fractured rib is sucked inside & Fixed
Site	MOST COMMON RIBS AFFECTED : 3RD -10TH RIBS At the most convex part of ribs			
Trauma	A-P compression			
Symptoms	▪ History of trauma ▪ Pain, swelling, Disturbance of function (Dyspnea)			
General Signs	Signs of Respiratory distress → Working Ala nasi, Cyanosis			
Inspection	Ecchymosis, bruises, ↓ Movements			Ecchymosis, bruises & Intermediate segment of fractured rib is sucked inside & Fixed
Palpation	Tenderness, Crepitus, ↓ TVF			
Auscultation	↓ Air entry			
Others	Associated chest injuries, abdominal injuries			
Complications	Pneumothorax , Hemothorax, Rupture mediastinum, Kidney, Spleen, Liver			
Investigations	▪ Plain x-ray: Sites of fractures can be seen ▪ ABGs.... ↓ O2 Saturation, ↑ CO2 saturation in blood		▪ CXR, CT scan, ABGs, KFTs ▪ Us → rupture spleen	
Treatment	ABCD (if Poly-traumatized patient), Resuscitation & Monitoring after 1ry survey , Secondary survey			
	# Strapping, Morphine (MORPHINE COULD BE GIVEN IF VENTILATION COULD BE SUPPORTED)	Immobilization : - Internal by Controlled Ventilation - External by Adhesive trapping	☒ If small segment → Strapping chest over firm pad ☒ If severe paradoxical Respiration → Positive Pressure Respiration by Ventilator ☒ If there's an indication of Thoracotomy → ORIF	▪ Adhesive Strapping ▪ Reduction by traction ▪ ORIF ...

PNEUMOTHORAX

CLOSED		OPEN		TENSION	
Definition	Little amount of air is entrapped into pleural cavity	Pleural space communicates with exterior		Valvular tear allowing air to enter but not to come out from the pleural space	
Etiology	Spontaneous	Traumatic (Accidental or Iatrogenic)			
Pathology	ال LUNG بتصيح و القلب بيرقص لكن الدم واقف بيتفرد 	Respiratory Failure	■ Paradoxical Respiration on affected side : ➤ Expands with expiration ➤ Collapses with Inspiration ■ Pendulum Respiration ➤ Oscillation of air between 2 lungs ➤ Normal lung is always filled with air deficient in O₂ loaded with CO₂	■ ↑Intra-pleural Pressure ■ Mediastinal shift to opposite side leading to collapse of other lung 	
		Circulatory Failure	■ Mediastinal Flutter ■ Loss of Negative Intra-thoracic Pressure	Loss of -VE Intra-thoracic Pressure= ↓VR Kink of Aorta= ↓COP	
CLINICAL PICTURE					
Symptoms	■ History of trauma , Chest pain, Dyspnea ,cough, cyanosis				
General examination	MILD CONDITION		■ Signs of shock: ↑Pulse, ↓BP, Subnormal Temp. ■ Resp. distress: working ala nasi, cyanosis, tracheal shift		
Local examination					
Inspection	↓Chest movement on affected site	Ecchymosis , Bruises , ↓Chest movement			
Palpation	■ ↓ TVF on affected site				
	NO mediastinal shift		Shift of trachea to opposite side		
Percussion	HYPER-RESONANCE		HYPER-RESONANCE	TYMPANIC RESONANCE	
Auscultation	↓Air entry ... (in Open pneumothorax → Whistling sound)				
Investigations	■ JET BLACK on the affected side ■ NO Broncho-vascular markings ■ Edge of collapsed lung is visible CXR 		■ JET BLACK on the affected side ■ Total lung collapse on affected side ■ Partial collapse on opposite side ■ Mediastinal shift to opposite side ■ Diaphragmatic flattening	Not needed Done if Diagnosis is suspicious	
First Aid	■ ABCD at site of accident , Resuscitation & Primary survey ■ Monitoring & secondary survey				
Definitive Treatment	NO Dyspnea : ✓ Conservative TTT ✓ Monitoring + ABGs Dyspnea : Intercostal tube under water seal until complete expansion of collapsed lung 		■ Suture wound ■ Intercostal tube under water seal in 2nd Space MCL	Intercostal tube under water seal in 2nd Space MCL Recently : In 5th space and directed towards apex of lung	

HEMOTHORAX

DEFINITION: Collection of blood in the Pleural space

ETIOLOGY:

LOCAL CAUSES:

- Traumatic injury of intercostal vessels, internal mammary vessels or lung tissue
- Post-operative
- Pathological (tumors, Aortic aneurysm)

GENERAL CAUSES:

- Blood disease
- Hypertension
- Drugs

PATHOLOGY & CP

1- THE COLLECTED FLUID:

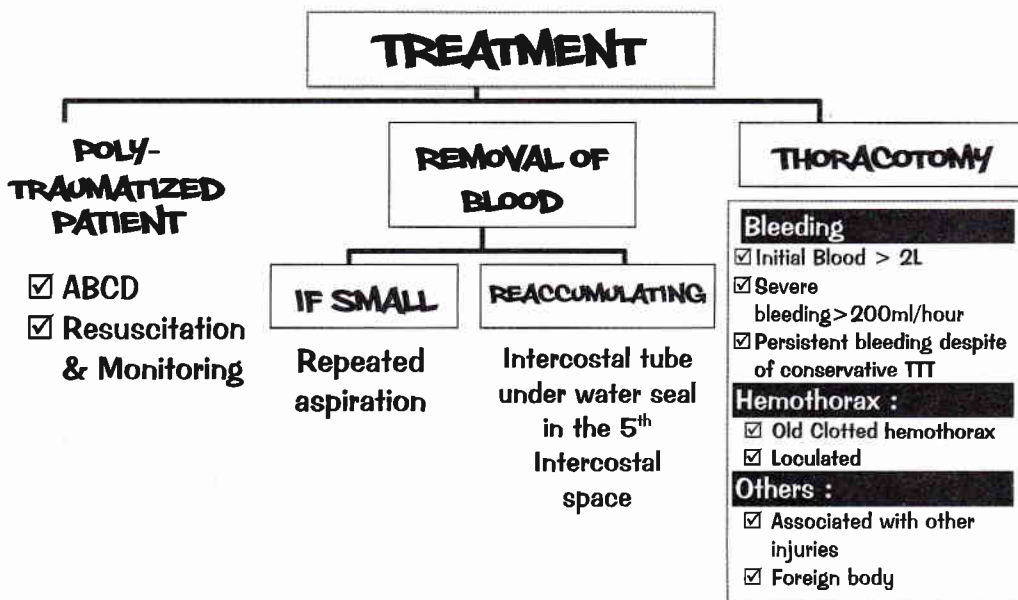
- Remains fluid in the pleural space in most of the cases as respiratory & Cardiac movement defibrinates blood
- Very irritant as it contains an effusion rich in Proteins
- Excellent culture for infection (COMMON)

2- May be associated with Pneumothorax

CLINICAL PICTURE: As pneumothorax except **DULL ON PERCUSSION**

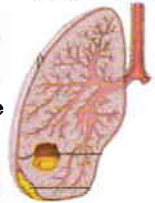
INVESTIGATIONS

- CXR
 - ✓ Obliteration of costo-phrenic Angle, opacity rising to axilla
 - ✓ Fractures
- Aspiration → Blood
- For complications → ABGs, investigations For associated injuries



EMPHYEMA

DEFINITION:
Collection
of Pus in the
Pleural space



ACUTE

ETIOLOGY

- **ORGANISM:** PNEUMOCOCCI (MOST COMMON), Staph, Putrid Empyema, Strept.
- **ROUTE:** Local, Direct, Blood
- **PDF:** Children following Lobar Pneumonia

CLINICAL PICTURE

	Symptoms	Signs
GENERAL	FAHM	▪ Fever, Tachycardia ▪ Cyanosis, working Ala nasi
LOCAL	▪ Cough ▪ Dyspnea ▪ Chest pain	▪ INSPECTION: ↓ Movement ▪ PALPATION: ↓ TVF, shift of mediastinum ▪ PERCUSSION: Dullness ▪ AUSCULTATION: ↓ Air entry



COMPLICATIONS

- General: Toxemia, Bacteremia, Septicemia, Pyemia
- Local: Chronicity, Spread

INVESTIGATIONS

- CBC: ↑ TLC, ↑ ESR
- CXR: obliteration of costo-phrenic angle with opacity rising towards axilla
- Thoraco-centesis: Pus → C&S

TREATMENT:

- **GENERAL:** Rest, analgesics, antibiotics, anti-pyretics
- **LOCAL:**
 - 1) Aspiration
 - 2) If Failed → Closed drainage
(By insertion of intercostal tube under water seal in the 5th - 7th space at mid axillary line)
 - 3) If Failed → Open Surgical drainage
(By rib resection & surgical evacuation of pus only when full localization has occurred)

CHRONIC

OPEN

CLOSED

	OPEN	CLOSED
ETIOLOGY	▪ Inadequate drainage ▪ Inadequate post-op. care ▪ Underlying disease ▪ Poor general condition	▪ Encysted Empyema ▪ Recurrent Empyema
CLINICAL PICTURE	▪ General → Chronic toxemia, acute exacerbations (Fever, chills) ▪ Local → Chronic sinus in chest wall	EMPYEMA NECESSITANS ▪ Perforation of intercostal space → SC abscess → Expansile impulse on cough
COMPLICATIONS	▪ As acute empyema + ▪ PULMONARY FIBROSIS ▪ 2ry AMYLOIDOSIS	
INVESTIGATIONS	▪ Culture & Sensitivity for sputum or pus ▪ CBC → Anemia, ↑ ESR, ↑ TLC ▪ CXR → overcrowded ribs, shift of trachea, elevation of diaphragm ▪ CT CHEST + BIOPSY ... "most accurate" ▪ Bronchoscope	
TTT	▪ General → correction of anemia, control DM ▪ Antibiotics, Multi-vitamins ▪ Local Re-drainage by rib resection + Physiotherapy ▪ Decortication + lung expansion ▪ If failed → Thoracoplasty for localized areas	

PNEUMOCOCCAL vs. STREPTOCOCCAL EMPYEMA

	PNEUMOCOCCAL EMPYEMA	STREPTOCOCCAL EMPYEMA
Incidence	Most common	Less
Onset	METAPNEUMONIC After lobar pneumonia	SYNPNEUMONIC With broncho-pneumonia
Pus	Thick, green	Thin, yellow
Localization	Adhesions	NO adhesions

POST-OPERATIVE PULMONARY COMPLICATIONS

Types of postoperative pulmonary complications

- I. Aspiration → Aspiration of oral secretions
→ Inhalation of gastric content (Mendelson's syndrome)
- II. Excessive secretions:
 - a- Bronchitis, Bronchopneumonia
 - b- Lung abscess
 - c- Atelectasis
 - d- Empyema
- III. Pulmonary embolism
- IV. Adult respiratory distress syndrome (ARDS)



2) ASPIRATION

ASPIRATION OF ORAL SECRETIONS

- It occurs in the post-anesthetic period when the vital reflexes as swallowing & coughing are absent.
- The result is pneumonia, which is usually mild & treated as atelectasis.

INHALATION OF GASTRIC CONTENTS (MENDELSON'S SYNDROME)

ETIOLOGY

- During induction of anesthesia in a Patient with full stomach or has intestinal obstruction.
- In comatose patients, e.g. after head injury or drug poisoning.

CLINICAL PICTURE

- Wheezes, cyanosis, tachycardia, tachypnea & hypotension.

COMPLICATIONS

- Severe pneumonitis, which may be fatal.

INVESTIGATIONS

- CXR → widespread lung infiltration (Rt. > Lt., ↑ in Lower lobes)
- ABGs → severe hypoxia.

TREATMENT

- PROPHYLAXIS → all high-risk patients should have a nasogastric tube inserted before the operation for suction of the gastric contents.
- Endotracheal intubation & suction of the aspirated material → cleaning with saline irrigations.
- Antibiotics, corticosteroids.

1) ↑ BRONCHIAL SECRETIONS

BRONCHITIS

- **MOST COMMON POSTOPERATIVE COMPLICATION.**
- **ETIOLOGY:** De novo or as an exacerbation of a pre-existing bronchitis.
- **TYPES:** Simple cough with muco-purulent sputum, severe suppurative bronchitis.
- **O/E:** Rhonchi & crepitations all over the lungs.
- **CXR:** normal.

BRONCHOPNEUMONIA (ASPIRATION PNEUMONIA)

- **ETIOLOGY:** Bronchitis → Patchy consolidations
- **ORGANISMS:** H. influenza, pneumococci, Staph aureus.
- **O/E:** FEVER 39°C, Bronchial breathing is heard, Patient looks ill.
- **CXR:** patchy mottling.

ATELECTASIS

- Pulmonary collapse, **IN THE FIRST TWO DAYS POST-OPERATIVE**, in the morning.
- **ETIOLOGY:** Bronchitis → occlusion of a bronchus by viscid secretions of mucus or pus → Atelectasis of the affected lobe.
- **PREDISPOSING FACTORS:**
 - ↳ Depression of cough reflex, by pain or sedation & poor ventilation.
 - ↳ Production of tenacious mucus due to:
 - Pre-operative Respiratory tract infections, inhalation of FBs, vomitus or septic material.
 - Premedication with atropine.
 - Prolonged Ether anesthesia.
 - Post-operative dehydration.
- **PATHOLOGY**
 - Obstruction of a bronchus by a plug of mucous → absorption of air distal to the obstruction and deflation of the affected area.
 - **THE CONSEQUENT COLLAPSE MAY BE:**
 1. **Lobular:** collapse of scattered areas throughout the lung.
 2. **Lobar:** collapse of one lobe usually the lower.
 3. **Massive:** collapse of the whole lung.
- **CLINICAL PICTURE POST-OPERATIVE FEVER IN THE FIRST 2 DAYS**
 - The patient does not feel well, is breathless & there may be fever & tachycardia.
 - Restricted movement of the affected side of the chest
 - **PERCUSSION & AUSCULTATION:** Impaired percussion note & diminished breath sounds.
 - Slight cough and sputum is difficult to expel and scanty.
- **INVESTIGATIONS**
 - **CXR:**
 - The collapsed lobe appears as a **HOMOGENEOUS WEDGE-SHAPED OPACITY**.
 - Major atelectasis causes approximation of the ribs, elevation of the diaphragm and deviation of the mediastinum toward the affected side.

LUNG ABSCESS

- Broncho-pneumonia or atelectasis → Fever & sudden expectoration a large amount of pus.
- **CXR:** cavity with fluid level.

EMPHYEMA

DEFINITION: It is an occasional complication of any of the above.

TREATMENT OF ↑ BRONCHIAL SECRETIONS

PROPHYLACTIC

- Postpone operations in patients with bronchitis until treated properly.
- They should be taught breathing & coughing exercises.
- Smoking should be stopped for several days before operation.
- Dental sepsis should be treated.
- At the end of the operation, the tracheo-bronchial tree should be aspirated thoroughly.
- Early return of consciousness & cough reflex should be aimed to.
- Breathing & coughing exercises started very soon after recovery.
- Pain is controlled by small doses of pethidine → it does not depress respiration.

ESTABLISHED CASES

- Physiotherapy, steam inhalations and expectorants → encourage expectoration.
- If not enough → catheter suction is performed.
- If not effective → bronchoscopic suction of bronchial tree under local anesthesia.
- If atelectasis recurs, bronchoscopy is repeated or tracheostomy is done (better) especially when the secretions are profuse. It diminishes the dead space, & provides easy access for repeated aspirations.
- Sputum is examined microscopically & cultured → proper antibiotic is given.

3) ADULT RESPIRATORY DISTRESS \$

Definition

- Lung condition that leads to low O_2 level in blood.
- It is also called: non-cardiogenic pulmonary edema.

Etiology

1. Severe sepsis. Patients in septic shock are particularly at risk of developing ARDS.
2. Severe shock (any type) especially if requiring large volumes of IV fluids.
3. Major trauma.
4. Extensive burns.
5. Iatrogenic factors:
 - Non-filtered blood transfusion.
 - Overtransfusion of fluids.
 - Use of oxygen concentrations over 50%.
 - Massive doses of steroids.
6. Lung injury due to trauma, inhalation of fumes or aspiration of gastric contents.

Pathophysiology

- ARDS is associated with severe and diffuse injury to the alveolar-capillary membrane (the air sacs and small blood vessels) of the lungs.
- Some alveoli distend with fluids, while some other alveoli collapse.
- This alveolar damage impedes the exchange of oxygen and carbon dioxide, which leads to a reduced concentration of oxygen in the blood.
- Defect in the 3 aspects of the respiratory process (ventilation / perfusion / diffusion).
- Hypoxia causes damage to other vital organs of the body such as the kidneys.

Pathology

Macroscopic picture → Great increase in lung weight, Petichial hemorrhages on epithelial surfaces.

Microscopic picture

- Interstitial edema and hemorrhage, Alveolar edema, Peri-alveolar hemorrhage.
- Inconstantly, intravascular fat globules and fibrin plugs.

Clinical Diagnosis

1. Medical history of conditions that can lead to ARDS e.g. severe pneumonia.
2. Initial state:
 - Shock
 - Lactic acidosis
 - Hyperventilation (low $PaCO_2$, but PaO_2 may be normal or slightly low).
3. Phase of hemodynamic equilibrium (lasts for several days):
 - The patient may appear well recovering
 - Chest X-ray is normal
 - PaO_2 is invariably low
4. Phase of clinical respiratory distress followed by respiratory failure:
 - Confusion and occasional petechial rash.
 - Chest x-ray reveals bilateral pulmonary infiltrations.
 - Rising $PaCO_2$ and falling PaO_2 occur despite oxygen supplement.

Complications of ARDS

- 1- Infection.
- 2- Pneumothorax.
- 3- Deep vein thrombosis (DVT) & pulmonary embolism.
- 4- Lung scarring:
 - ARDS causes the lungs to become stiff (scarred) → cannot expand.
 - Being on a ventilator for a long time also can cause lung scarring.

Investigations▪ **Laboratory:**

- a- **ABG:** reveals hypoxemia (reduced levels of oxygen in the blood).
- b- **CBC:** ↑WBCs in sepsis.

▪ **Radiological:**

- a- **CXR:** may show the presence of fluid in the lungs.
- b- **CT scan chest:** may be required only in some situations (routine chest x-ray is sufficient in most cases).
- c- **Echocardiogram:** exclude heart problems that cause fluid build-up in the lung.

▪ **Instrumental:**

- a- Monitoring with pulmonary artery catheter may be needed to exclude a cardiac cause for the difficulty in breathing.
- b- Bronchoscopy may be considered to evaluate the possibility of lung infection.

Treatment

- Admission to an intensive care unit (ICU).

▪ **Treatment is primarily supportive using:**

1. Supplemental oxygen.
2. Mechanical ventilator (in the stage of respiratory failure indicated by a $\text{PaO}_2 < 60 \text{ mmHg}$).
3. Treatment of the cause e.g. correction of shock and eradication of sepsis.
4. IV fluids are given to provide nutrition and prevent dehydration, and are carefully monitored to prevent fluid from accumulating in the lungs (pulmonary edema).
5. The following drugs may be administered:
 - **Antibiotics** to treat infection because it is often the cause of ARDS.
 - Anti-inflammatory drugs, such as **corticosteroids**, to reduce inflammation in the lungs in the late phase or sometimes if the person is in septic shock.
 - **Diuretics** to eliminate fluid from the lungs.
 - **Drugs to counteract low blood pressure** that may be caused by shock.
 - **Anti-anxiety** drugs to relieve anxiety.
 - **Inhaled drugs** administered by respiratory therapists to decrease inflammation and provide respiratory comfort.

4) POST-OPERATIVE HYPOXIA

Manifests clinically by

- Restlessness, anxiety or confusion.
- Tachypnea, Tachycardia, arrhythmias or hypotension.
- Central cyanosis is late.

Common causes

- Pulmonary aspiration.
- Failure to breathe deeply and cough during recovery from anesthesia.
- Airway block by secretions.
- Hypoventilation due to pain of upper abdominal or thoraco-abdominal incisions, opiates overdose or prolonged recumbency.
- Pulmonary embolism.
- Pulmonary edema.

Investigations

1. Pulse oximetry.
2. ABG; ↑PCO₂ (ventilation failure) and ↓PO₂ (Oxygenation failure)
3. Chest x-ray

Treatment

- Treat the specific cause.
- The patient may need mechanical ventilation.



1. Poly-traumatized patient presents with acute chest pain, dyspnea and cyanosis. Auscultation shows diminished air entry. Lung percussion gives tympanic resonance on affected side. Chest x-ray shows jet black opacity.

Pneumothorax

2. Patient presents with dull aching or stitching pain, cough and dyspnea. CXR shows Homogenous opacity with obliteration of costo-phrenic angle rising to axilla.

Pleural effusion.

3. Poly-traumatized patient presents with acute chest pain, dyspnea and cyanosis. Auscultation shows diminished air entry. Lung percussion gives dullness on affected side. Chest x-ray shows obliteration of costo-phrenic angle.

Hemo-thorax.

4. Poly-traumatized patient presents with acute chest pain, dyspnea, cough, cyanosis, engorged neck veins & respiratory distress. E part of chest moves paradoxically with respiration.

Flail chest.

5. Immuno-compromized patient with past history to TB or recurrent pneumonia presents with subcutaneous swelling in the intercostal space gives expansile impulse with cough.

Empyema necessitans.

6. Old age patient heavy smoker presents with change of character of smoker cough and exaggeration of COPD manifestation.

Bronchogenic carcinoma



SURGI- TOONS

PEDIATRIC SURGERY



14

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PEDIATRIC SURGERY

- CONGENITAL ANOMALIES OF TESTIS
- SWELLINGS
(SEQUESTRATION, THYROGLOSSAL, BRANCHIAL)
- ECTOPIC THYROID
- ESOPHAGEAL ATRESIA
- JEJUNAL, ILEAL, BILIARY ATRESIA
- CHOLEDOCHAL CYST, HEPATOBLASTOMA
- HYDROCEPHALUS
- HEMANGIOMA
(INVOLUTING VS. NON INVOLUTING)

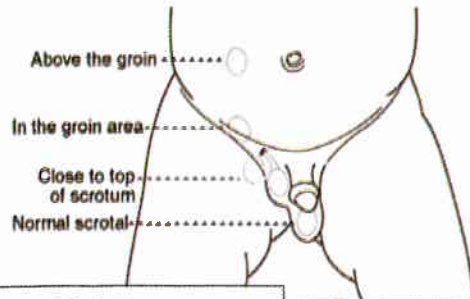


CONGENITAL ANOMALIES OF THE TESTIS

IMPERFECT DESCENT OF TESTIS

INCOMPLETELY DESCENDED TESTIS =ARRESTED =UNDESCENDED

UNILATERAL BILATERAL



Risk factors:

- ☒ Family History of un-explained newborn death or abnormal genitalia
- ☒ Fetus: DOWN &
- ☒ Mother:
 - <20, >35 years
 - Exposure to pesticides , toxic chemicals
 - Poor health

MAL-DESCENDED ECTOPIC TESTIS

- ☒ DEFINITION:
Testis passed **EXTERNAL RING** to an ectopic site
- ☒ ETIOLOGY: **LOCKWOOD THEORY**
- ☒ SITES:
 - Most common → **SUPERFICIAL INGUINAL POUCH**
 - Others:
 - a) Above root of Penis
 - b) Transverse scrotal
 - c) Femoral triangle
 - d) Perineal
- ☒ CLINICAL PICTURE:
 - SYMPTOMS: Mother C/O that one or both sides are empty
 - SIGNS:
 - a) Well-developed Scrotum
 - b) Normal Testis
 - c) Outside Inguinal canal
- ☒ COMPLICATIONS :
Psychological, liability to trauma, torsion
- ☒ TREATMENT: Orchiopexy

RETRACTILE TESTIS

- ☒ ETIOLOGY:
 - ↑↑CREMASTERIC REFLEX
 - In response to :
 - Cold exposure
 - Scratching medial side of thigh
- ☒ CLINICAL PICTURE:
 - Well-developed Scrotum
 - Normal Testis
 - DIAGNOSIS→ Make child squat to help descent of testis
- ☒ TREATMENT: Re-assurance

INCOMPLETELY DESCENDED TESTIS

UNILATERAL

BILATERAL

	UNILATERAL	BILATERAL
ETIOLOGY	☒ Dysgenesis (small testis) ☒ Large testis ☒ Short testicular artery ☒ Short spermatic cord ☒ Associated hernia sac ☒ Narrow inguinal ring, canal	☒ ↓ Maternal HCG ☒ ↓ Fetal pituitary Gonadotropins
INCIDENCE	☒ 30 % in PRETERM ☒ 50 % on Right side , 20% bilateral ☒ Urinary tract anomalies in 13.5 % Most common site of arrest is INGUINAL CANAL	
CLINICAL PICTURE	☒ SYMPTOMS: Mother C/O that one or both sides are empty ☒ SIGNS: Poorly developed scrotum, Poorly developed Testis , usually in the inguinal canal ☒ Associated anomalies	
COMPLICATIONS	☒ Psychological ☒ Liable to trauma ☒ Liable to Malignancy → SEMINOMA (x30 times) ☒ Indirect inguinal hernia ☒ Epididymo-Orchitis ☒ Sterility: (Bilateral causes → Cryptorchidism, Hypogonadism)	
INVESTIGATIONS	☒ Best by Laparoscopy ☒ US, CT scan ☒ IN BILATERAL CASES → Hormonal assay, Karyotyping	
TREATMENT	☒ Orchiopexy for affected side At 6-24 months (Preserve hormonal function) ☒ Methods : 1) De-Neto 2) Bi-Van 3) If cord is short : ✓ Dissection to elongate it ✓ Fowler-steven Technique	1- Hormonal therapy → B-HCG ☒ 500 IU/ twice weekly ☒ IM ☒ For 4-6 weeks # HCG > 6 weeks # Testosterone 2- If failed → Orchiopexy

ECTOPIC THYROID

DEFINITION

Presence of thyroid tissue in a site other than the normal site

SITES

- **MOST COMMON IS LINGUAL THYROID**
- Retrosternal is the 2nd most common.

CLINICAL PICTURE

- Lingual → tongue swelling → dyspnea, dysphagia.
- Retrosternal → pressure manifestations.

COMPLICATIONS

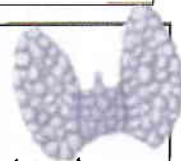
- Pre-cancerous (papillary carcinoma).

INVESTIGATIONS

- CT scan: detect exact site and extension.
- TC₉₉ scan: detect other co-existing functioning thyroid.

TREATMENT

- Surgical removal if normal thyroid co-exists.
- If not → remove and re-implant in the arm



SWELLINGS

	SEQUESTRATION DERMOID	THYROGLOSSAL CYST	BRANCHIAL CYST
Etiology	Sequestration of piece of epithelium at a line of fusion	Un-obliterated portion of Thyroglossal duct	☒ Persistent Cervical sinus → Cyst ☒ 2 nd arch doesn't fuse with 5 th → Fistula
Patient	Child (occurs during fetal life)	Child 6-8 years	appears at age of <u>20 years</u>
CLINICAL PICTURE			
C/O	Slowly growing , Painless, SC swelling	Slowly growing painless swelling in the midline of Neck	Slowly growing painless at Lateral side of neck
Site	<u>2 على الجانبي و 2 على الودان و 2 على الذقن</u> Most Common → External angular ☒ External angular Internal angular ☒ Post-auricular Pre-auricular ☒ Supra-myelohyoid Infra-Myelohyoid Never in LIMBS "budding"	Most common SUBHYOID in MIDLINE of Neck	- upper part of Neck → Anterior Triangle - Passes bet ECA, ICA Deep to anterior border of Upper 1/3 of Sternomastoid - Extend to side of nasopharynx "Fossa of Rosenmuller"
Size		Small	
Shape	Globular	Rounded	Rounded, oval
Surface		Normal skin or fistula	smooth
Edge	Well defined		Well defined
Consistency	Lax, Cystic		Tense
Relations	Not attached to Skin.	Moves to side to side	
Special Characters	- External angular → lie on Bone defect - Pedicle connects deep aspect of cyst to dura matter (Dumble shaped or Hourglass dermoid)	Moves up with deglutition & protrusion of Tongue	PULSATING COMPRESSABLE
Complications	As any cyst (infection, rupture, Hge, pressure) + ... - Cerebral compression, IC complication - Recurrence	- Most common is INFECTION - Thyroglossal Fistula (Acquired, NEVER CONGENITAL)	MOST COMMON: INFECTION (↑ LNs) Fistula (Congenital Or Acquired) - Adenocarcinoma
Investigations	Skull x-ray for bone defects	- Cyst → US - Fistula → Fistulogram	- U/S → Diagnosis of cyst & Exclude D.D. - Fistulogram → Fistula
Treatment	- Uncomplicated → Excision - If infected → INCISION & DRAINAGE EXCISION after inflammation subsides - If hourglass → wait for closure of skull	SISTRUNK OPERATION - Cyst, track - Central part of Hyoid bone - Pyramidal lobe	- Cyst → Complete excision - If fistula → Excision By STEP LADDER OPERATION

ESOPHAGEAL ATRESIA AND TRACHEO-ESOPHAGEAL FISTULA

Definition

- Failure of recanalization of foregut $\pm$ failure of its separation from the trachea (fistula).

Incidence

- 1/4000 live birth, more common in males.

Types

- EA + distal TEF (fistula of lower pouch), commonest.
- Pure EA (without TEF), 2nd most common.
- EA with proximal TEF (fistula of upper pouch).
- EA with double TEF (fistulas with both pouches).

Symptoms

- Any newborn presenting with frothy saliva should be considered having EA until proved otherwise.

Signs

- General:
 - Bad chest (aspiration pneumonia).
 - Bad general condition (dehydration & FTT).
 - Associated anomalies.
- Local:
 - If distal fistula $\rightarrow$ abdominal distension with respiration.
 - If no distal fistula $\rightarrow$ scaphoid abdomen.
 - Catheter test $\rightarrow$ arrested 10cm from nostrils.

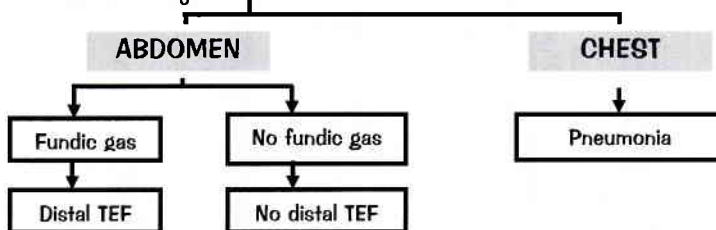
Causes of death

- Associated anomalies.
- Pneumonia (always present).

Investigations

- For diagnosis:

- Plain x-ray:



- Gastrographin $\rightarrow$ diagnoses EA and proximal fistula (visualization of bronchial tree).

- For general condition: ABGs, CBC, KFT, LFT.
- For associated anomalies: U/S & Echo.

Treatment (EMERGENCY)

- Preoperative preparation $\rightarrow$ Excision of fistula + primary end-to-end anastomosis.
- Treatment of associated anomalies.

N.B. if long gap or bad general condition $\rightarrow$ esophagostomy for draining upper pouch + gastrostomy for feeding $\rightarrow$ then, later on life, definitive repair by stomach pull-up, colon or small bowel transposition

BILIARY ATRESIA

Definition

- Congenital stricture of bile ducts due inflammatory process of unknown etiology.

Types

- A. Intra-hepatic.
- B. Extra-hepatic
 - Type I → involves CBD
 - Type II → + CHD
 - Type III → + Rt. & Lt. hepatic ducts

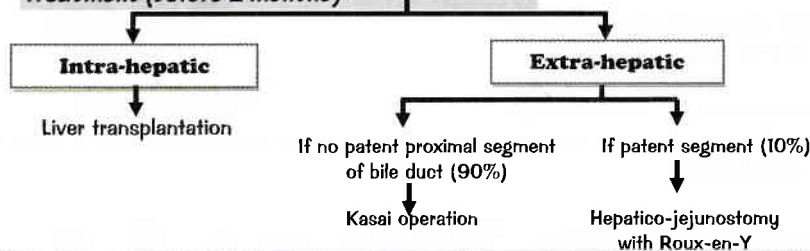
Clinical Picture

Neonate with obstructive jaundice:..... Olive green jaundice, Dark urine & clay stool, Pruritis

Investigations

1. Lab: LFTs → cholestatic pattern (↑ Bil. & alk. P)
2. HIDA scan → non visualization of duodenum.
3. Liver biopsy:
 - If intra-hepatic → no bile ducts.
 - If extra-hepatic → dilated intra-hepatic ducts.

Treatment (before 2 months)



JEJUNAL ATRESIA

Clinical picture: Early vomiting in the 1st 24 hrs.

Investigations

X-ray → TRIPLE BUBBLE SIGN + Dilated bowel

Treatment

- Resection + end-to-end anastomosis.

ILEAL ATRESIA

Clinical picture

Abdominal distension in the 1st 24 hours ± vomiting.

Investigations

X-ray → Dilated bowel + multiple fluid levels.

Treatment

- Resection + end-to-end anastomosis.

CHOLEDOCHAL CYST

Types

- MOST COMMON → DIFFUSE DILATATION OF CBD
- CAROLI'S DISEASE (Multiple intra-hepatic cysts)

Clinical Picture

Stasis (Cholangitis), Swelling at Rt. Hypochondrium,
Rupture → biliary peritonitis.

Complications: Cholangiocarcinoma.

Investigations

U/S, CT scan or MRI, ERCP, Operative cholangiography

Treatment

- Diffuse dilatation → excision of the cyst + choledocho-jejunostomy.
- Caroli's disease → liver transplantation.

HEPATOBLASTOMA

Incidence

MOST COMMON MALIGNANT LIVER
TUMOR IN CHILDREN

Spread

- May be metastasis to the lungs.

Clinical Picture

Abdominal mass in children <3 years.

Investigations

1. U/S, CT scan or MRI.
2. Elevated serum α-fetoprotein.

Treatment

- Chemotherapy + resection

HYDROCEPHALUS

Definition

- Disturbance of formation, flow or absorption of CSF → ↑ volume of the ventricular system.

Types

- Communicating: mostly due to defective CSF absorption.
- Non-communicating: mostly due to obstruction of the ventricular system.

Etiology

- Congenital causes: stenosis of Aqueduct of Sylvius – Arnold Chiari malformation.
- Acquired causes: mass lesions, ventricular hemorrhage or infection (post-meningitis).

Clinical Picture

- Poor feeding, vomiting & delayed mental activity.
- Head enlargement (> 98th percentile).
- Widely-opened skull sutures.
- Tense bulging fontanelles.
- Dilated scalp veins.
- McEwen's sign (resonance on percussion).
- Sunset sign.

Investigations

- CT scan & MRI are investigations of choice.
- Skull x-ray → silver-beaten appearance.

Treatment

- Medical: Acetazolamide to ↓ CSF production.
- Surgical: most preferred is shunt (most commonly used ventriculo-peritoneal shunts) → liable to obstruction and infection.



HEMANGIOMA

	INVOLUTING HEMANGIOMA	NON-INVOLUTING HEMANGIOMA
<i>Definition</i>	True neoplasm of endothelial cells but undergo complete spontaneous involution	These are hemangiomas present at birth and persist into adulthood
<i>Incidence</i>	More common	Less common
<i>Site</i>	Allover but common in both head and neck	Any body surface but common in face
<i>Clinical picture</i>	Appears after birth during the 1 st 2-3 weeks Grows rapidly for 4-6 months Involution progresses slowly by 5-7 years	Present at birth persists into adulthood Start as light red later on they deepen in color
<i>Types</i>	a- superficial b- deep c- combined (superficial & deep)	a- port wine b- cavernous c- a-v fistula the most common & venous racemose aneurysm
<i>Complications</i>	Ulceration 8%, infection, bleeding, airway obstruction, visual field defects, Kasbush-Merritt syndrome.	Psychological
<i>Treatment</i>	- Not usually indicated <u>Indications</u>: - appearance following spontaneous regression - large hemangioma of brow or eyelid - hemangioma of mucosal surface of lips - Treatment of complications.	Small → surgical excision with lry closure Large → super selective embolization to prevent misdirection avoiding skin necrosis. N.B. Recently, the best method for port wine stain is photo – thermolysis